A1-F18AC-580-100

15 MAY 1985
CHANGE 8 - 1 JUNE 2002

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE PRINCIPLES OF OPERATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

NAVY MODEL
F/A-18A AND F/A-18B
161353 AND UP

N68936-01-D-0007

PUBLISHED BY DIRECTION OF COMMANDER, NAVAL AIR SYSTEMS COMMAND

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NUMERICAL INDEX OF EFFECTIVE WORK PACKAGES/PAGES

List of Current Changes

Original 0 . . . . 15 May 85	Change 3 . . . . 15 Apr 87	Change 5 . . . . 1 Aug 88	Change 7 . . . . 1 Oct 00
Change 1 . . . . 15 Jun 86	Change 4 . . . . 15 Oct 87	Change 6 . . . . 1 Sep 92	Change 8 . . . . 1 Jun 02
Change 2 . . . . 1 Sep 86			

Only those work packages/pages assigned to the manual are listed in this index. Insert Change 8, dated 1 June 2002. Dispose of superseded work packages/pages. Superseded classified work packages/pages shall be destroyed in accordance with applicable security regulations. If changed pages are issued to a work package, insert the changed pages in the applicable work package. The portion of text affected in a change or revision is indicated by change bars or the change symbol "R" in the outer margin of each column of text. Changes to illustrations are indicated by pointing hands, change bars, or MAJOR CHANGE symbols. Changes to diagrams may be indicated by shaded borders.

Total number of pages in this manual is 320 consisting of the following:

NUMERICAL INDEX OF EFFECTIVE WORK PACKAGES/PAGES (Continued)

LIST OF TECHNICAL PUBLICATIONS DEFICIENCY REPORTS INCORPORATED

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes TPDR WP, dated 1 October 2000.

1. The TPDRs listed below have been incorporated in this issue.

IDENTIFICATION NUMBER/ QA SEQUENCE NUMBER	LOCATION
NONE	

ALPHABETICAL INDEX

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP001 00, dated 15 May 1985.

Title	WP Number

INTRODUCTION

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP002 00, dated 1 October 2000.

1. PURPOSE.

2. This manual provides the technician with a general understanding of how the various components function in the system.

3. REQUISITION AND AUTOMATIC DISTRIBUTION OF NAVAIR TECHNICAL MANUALS.

4. Procedures to be used by Naval activities and other Department of Defense activities requiring NAVAIR technical manuals are defined in NAVAIR 00-25-100 and NAVAIRINST 5605.5A. To automatically receive future changes and revisions to NAVAIR technical manuals, an activity must be established on the Automatic Distribution Requirements List (ADRL) maintained by the Naval Air Technical Data and Engineering Service Command (NATEC). To become established on the ADRL , notify your activity central technical publications librarian. If your activity does not have a library, you may establish your automatic distribution by contacting the Commanding Officer, NATEC, Attn: Distribution, NAS North Island, Bldg. 90, P. O. Box 357031, San Diego, CA 92135-7031. Annual reconfirmation of these requirements is necessary to remain on automatic distribution. Please use your NATEC assigned account number whenever referring to automatic distribution requirements.

5. If additional or replacement copies of this manual are required with no attendant changes in the ADRL, they may be ordered by submitting a MILSTRIP requisition in accordance with NAVSUP 485 to Routing Identifier Code “NFZ”. MILSTRIP requisitions can be submitted through your supply office, Navy message, or SALTS to DAAS (Defense Automated Address System), or through the DAAS or NAVSUP web sites. For assistance with a MILSTRIP requisition, contact the Naval Inventory Control Point (NAVICP) Publications and Forms Customer Service at DSN 442-2626 or (215) 697-2626, Monday through Friday, 0700 to 1600 Eastern Time.

6. CONTENT.

7. Work packages contain description and operation of systems, subsystems, and components. The text is supported by component locators, block diagrams and simplified schematics.

8. **COMPONENT LOCATOR.** The component locator shows aircraft component location. The illustration shows the technicians view when possible.

9. **BLOCK DIAGRAMS.** Block diagrams consist primarily of blocks connected by lines. These diagrams portray the function of a system or subsystem.

10. **SIMPLIFIED SCHEMATICS.** Simplified schematics consist primarily of blocks connected by single lines with limited use of symbols and pictorial drawings of units. These schematics simplify system functions as much as possible. All schematics are shown with electrical power off, switches in off positions, and relays in deenergized position unless noted on schematic.

11. **SCHEMATIC HIGHLIGHTS.**

12. For schematic highlights see figure 1.

13. MANUAL ISSUE DATE.

14. The date on the title page is the copy freeze date. No additions, deletions, or changes are made after the manual issue date except last minute safety of flight or required maintenance changes. Data collected after the manual issue date will be included in later changes or revisions of the manual.

15. **EFFECTIVITIES.**

16. Effectivity notes on manual title pages, work package title pages, and within a work package indicate the aircraft or software program to which the data applies. If no effectivity note appears on the work package title page, the work package has the same effectivity as shown on the manual title page. The effectivity notes may use:

NOTE

Aircraft with model designator F/A-18B are the same type and model as TF/A-18A.

a. Type, model, and series

b. Bureau number (tail number)

c. Combination of type, model, series, and bureau numbers

d. Part number or serial number

e. Technical directive number

f. Configuration/identification number

17. The table below shows examples of effectivity notes and their meanings:

Effectivity Note Examples

Effectivity Note	Definition
160777 AND UP	Applicable to all F/A-18A, F/A-18B, F/A-18C and F/A-18D for bureau numbers listed.
F/A-18A, F/A-18B	Applicable to all F/A-18A and F/A-18B.
F/A-18C, F/A-18D	Applicable to all F/A-18C and F/A-18D.
F/A-18A	Applicable to all F/A-18A, but not F/A-18B, F/A-18C and F/A-18D.
F/A-18B	Applicable to all F/A-18B, but not F/A-18A, F/A-18C, and F/A-18D.
F/A-18C	Applicable to all F/A-18C, but not F/A-18A, F/A-18B, and F/A-18D.
F/A-18D	Applicable to all F/A-18D, but not F/A-18A, F/A-18B, and F/A-18C.
F/A-18A, F/A-18C	Applicable to all F/A-18A and F/A-18C, but not to F/A-18B and F/A-18D.
F/A-18B, F/A-18D	Applicable to all F/A-18B and F/A-18D, but not to F/A-18A and F/A-18C.
F/A-18A 160775, 160777 THRU 160782	Only applicable to some bureau numbers of F/A-18A. Not applicable to any F/A-18B, even if an F/A-18B bureau number is within the numbers listed.
F/A-18C 163427, 163430 THRU 163456	Only applicable to some bureau numbers of F/A-18C. Not applicable to any F/A-18D, even if an F/A-18D bureau number is within the numbers listed.

Effectivity Note Examples (Continued)

Effectivity Note	Definition
F/A-18B 160784 AND UP	Only applicable to some bureau numbers of F/A-18B. Not applicable to any F/A-18A, even if an F/A-18A bureau number is within the numbers listed.
F/A-18D 163434 THRU 163457	Only applicable to some bureau numbers of F/A-18D. Not applicable to any F/A-18C, even if an F/A-18C bureau number is within the numbers listed.
160775 THRU 160785 BEFORE F/A-18 AFC 772	Applicable to F/A-18A and F/A-18B for bureau numbers listed, before modification by technical directive.
161213 AND UP; ALSO 160775 THRU 160785 AFTER F/A-18 AFC 772	Applicable to aircraft modified during production; also applicable when affected aircraft have been modified by technical directive.
160775 THRU 160785; WHEN NO. 2 CONTROL PANEL P/N XXXX-X IS INSTALLED	Applicable to F/A-18A and F/A-18B for bureau numbers listed if panel P/N XXXX-X is installed. (Configuration before AVC)
161213 AND UP; ALSO 160775 THRU 160785; WHEN NO. 2 CONTROL PANEL P/N XXXX-Y (AVC-102) IS INSTALLED	Applicable to aircraft modified during production; also applicable to aircraft components modified to the production configuration by technical directive. (Configuration after AVC)
P/N MBEU65101-9, MBEU65101-10 & MBEU65105-3	Applicable to assemblies which are interchangeable between aircraft.
ENGINE NO. 215101 THRU 215109	Applicable to assemblies which are interchangeable between aircraft, but configurations can not be identified by part number.
CONFIG/IDENT NUMBER 84A	The CONFIG/IDENT number is the program load identification number which identifies the software program loaded in specific programmable units. Refer to A1-F18AC-SCM-000 for CONFIG/IDENT number tables.

18. TECHNICAL DIRECTIVES.

19. Technical directives are documents which direct the accomplishment, and recording of a retrofit configuration or inspection to delivered aircraft, or aircraft components.

20. **AIRFRAME CHANGE (AFC) AND AIRBORNE TACTICAL SOFTWARE CHANGE (ASC).** Technical directives which change configuration of aircraft structure or equipment installation, i.e. AFC, will list aircraft bureau numbers in effectivity notes and show before and after the AFC. Technical directives which change configuration of operational flight programs (OFP), i.e. ASC, will list the OFP CONFIG/IDENT NUMBER in effectivity notes and show the latest two authorized OFP programs. See AFC and ASC effectivity examples in Effectivity Note Example Table.

21. **AIRCRAFT COMPONENT CHANGES.** Technical directives which change configuration of aircraft components, i.e. AAC, ACC, AVC, AYC, and PPC will list part numbers in the effectivities. See AVC effectivity examples in Effectivity Note Example table.

22. RECORD OF APPLICABLE TECHNICAL DIRECTIVES.

23. The technical directives affecting this manual are listed in the Record of Applicable Technical Directives of each affected work package. Because an ASC directs all aircraft be modified within 30 days, ASC's are not listed. When all affected aircraft are modified,

the before configuration is removed from the manual, and the technical directive entry is removed from the Record of Applicable Technical Directives.

24. TECHNICAL PUBLICATIONS DEFICIENCY REPORT (TPDR).

25. The TPDR (OPNAV FORM 4790/66) is the form for reporting errors and suspected omissions in the technical manuals. Reporting procedures are in OPNAVINST 4790.2 SERIES.

26. DIAGRAMS.

27. Simplified schematics and block diagrams are in this manual. System schematics are in A1-F18A( )-( )-500 series manuals.

28. NAVY (AN) STANDARD/COMMON NAME NOMENCLATURE.

29. When an item has both Navy (AN) standard and common name nomenclature assigned, the common name nomenclature will be used in text and on illustrations. Full Navy (AN) standard nomenclature will be used in the Illustrated Parts Breakdown (IPB).

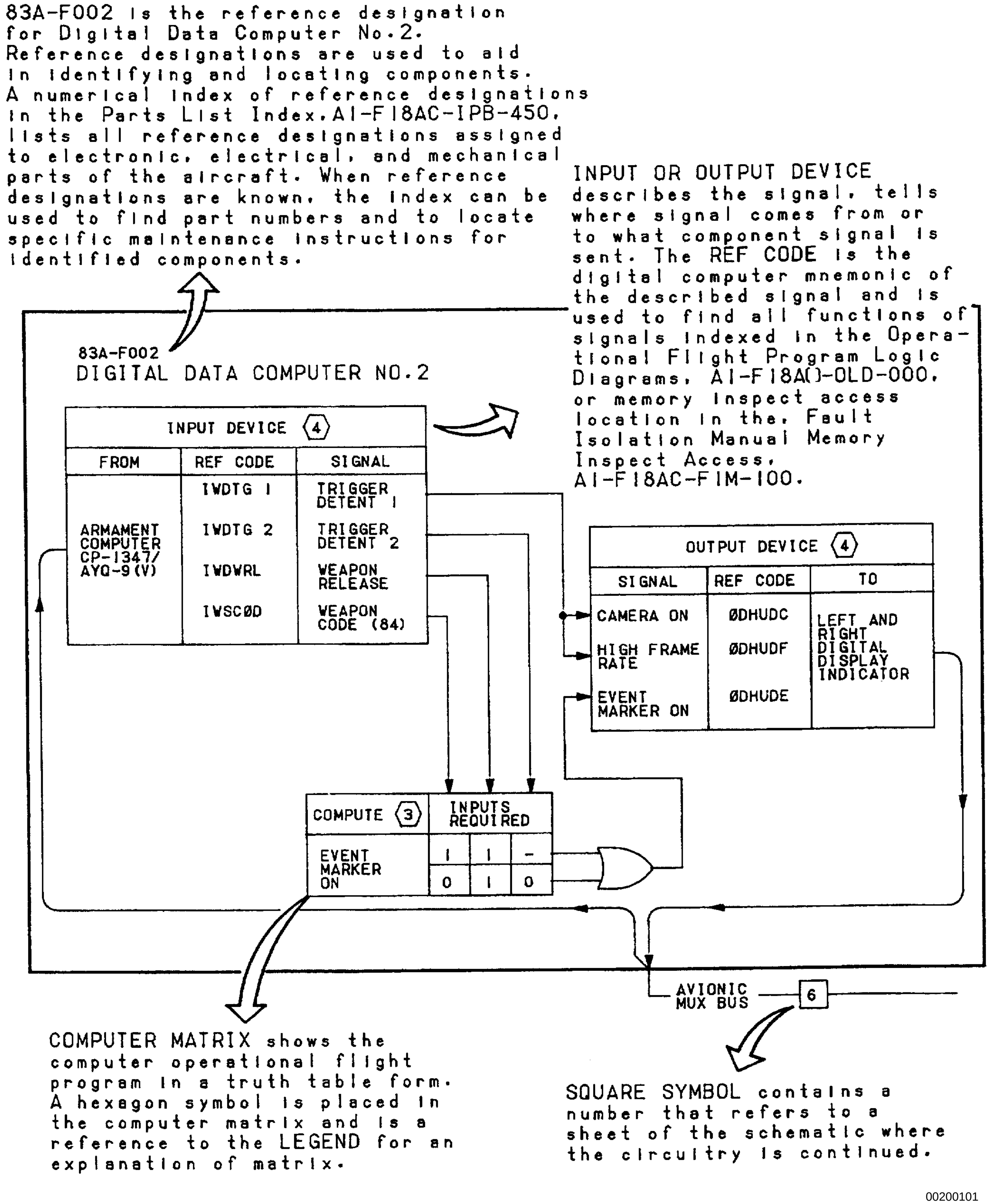
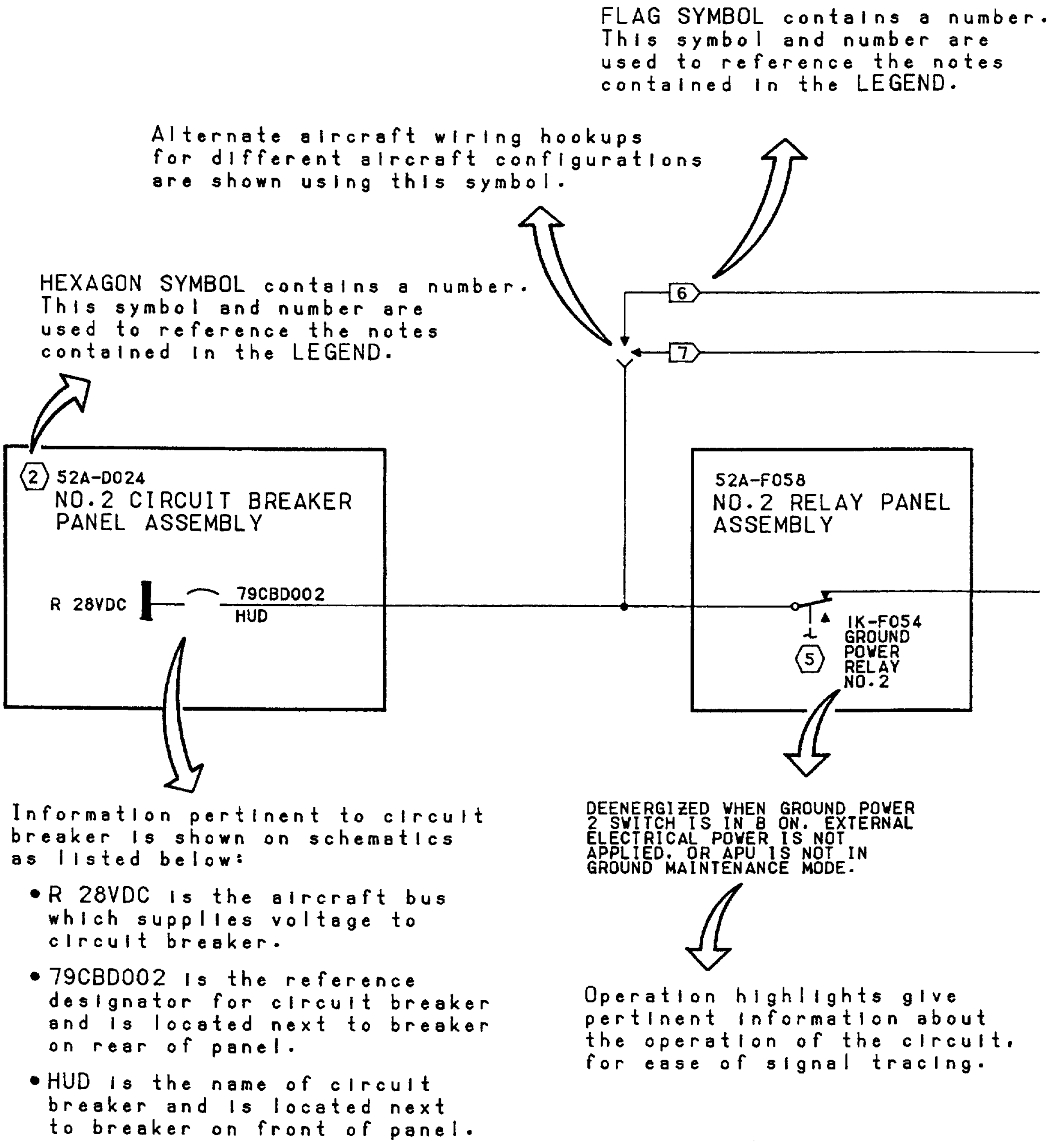


Figure 1. Schematic Highlights (Sheet 1)



00200102

Figure 1. Schematic Highlights (Sheet 2)

The legend contains all notes pertinent to the schematic as listed below:

NUMBER listed with no symbols is general information about the schematic.

NONSTANDARD SYMBOLS appearing on schematic are shown or referenced with an explanation.

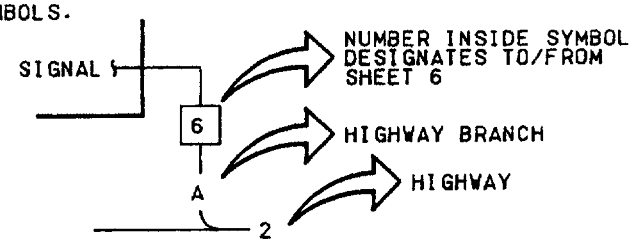
ABBREVIATIONS appearing on schematic are shown or referenced with an explanation.

HEXAGON SYMBOL refers to another schematic or manual for continuation of a circuit or an explanation of data contained on schematic.

FLAG SYMBOL indicates limited aircraft application.

LEGEND

1. NONSTANDARD SYMBOLS.



2 POWER DISTRIBUTION SYSTEM SIMPLIFIED SCHEMATIC. A1-F18AC-420-100, WP005 00.

3 EXPLANATION OF MATRIX

A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.

B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.

C. THE SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.

D. INTERPRET MATRIX TABLE AS INDICATED:

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.

(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.

(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

4 FOR LOGIC DIAGRAMS RELATING TO REF CODE, REFER TO A1-F18AC-OLD-000. FOR MEMORY INSPECT ACCESS LOCATION RELATING TO REF CODE, REFER TO A1-F18AC-FIM-100.

5 GROUND POWER SWITCHING SIMPLIFIED SCHEMATIC. A1-F18AC-420-100, WP005 00.

6 F/A-18A.

7 F/A-18B.

00200103

Figure 1. Schematic Highlights (Sheet 3)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

DESCRIPTION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

Maintenance Status Display and Recording System A1-F18AC-580-100
Component Locator WP004 00

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A18 IAFC-056	27 Mar 85	Fuel System Components Replacement and System Inspection (ECP MDA-F18-00158R1, and ECP MDA-F/A-18-00160)	15 May 85	-
F/A18 AFC 49	-	Addition of Sealed Lead Acid Battery (ECP-MDA-F/A-18-00074)	1 Sep 86	ECP coverage only

Record of Applicable Technical Directives (Continued)

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 39	-	No. 1 Fuel Tank Interconnect Valve Replacement and Fuel Sequencing Modification (ECP MDA-F18-00072C1)	15 Apr 87	ECP coverage only
F/A-18 AFC 70	-	Motive Flow Fuel Boost Pump Pressure Switch; Installation of (ECP MDA-F18-00158R2 and ECP MDA-F/A-18-00160)	15 Oct 87	ECP coverage only
F/A-18 AFC 90	-	GFE Battery Relay Control Unit; Incorporation of (ECP MDA-F/A-18-00165R1)	1 Aug 88	ECP coverage only
F/A-18 AFC 253	-	U.S. Naval Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

1. INTRODUCTION.

2. The maintenance status display and recording system (MSDRS) descriptions are:

a. system description

b. system components

c. related systems

d. system controls and indicators

3. SYSTEM DESCRIPTION.

4. The MSDRS is made up of the Signal Data Recording Set AN/ASM-612, Digital Data Set AN/ASQ-215 (After F/A-18 AFC 253 or F/A-18 AFC 292 and F/A-18 AFC 225) and the fatigue strain gages. The AN/ASQ-215 is composed of the Mission Data Loader (MDL) MU-1053/A and MDL Mount CP-2092(P)/A, these are also known as Data Transfer Module (DTM) and Interface Receptacle Unit (IRU) respectively. For a simplified block diagram, see figure 1. For system component, control, and indicator location, see WP004 00.

5. The MSDRS monitors engines and airframe operational status for unit failures and caution/advisory conditions when the mission computer system is operating. The MSDRS sends data to the mission computer system for processing. When the mission computer system detects a caution/advisory condition, it commands the multipurpose display group to display the applicable caution or advisory message in the cockpit. If the mission computer system detects a unit failure, it commands the MSDRS to store the applicable maintenance code. When the mission computer system detects specific conditions, it commands the MSDRS to record significant maintenance data and selected tactical information on magnetic tape. The pilot commands the recording of inflight engine condition monitoring data from the cockpit. When manually activated by maintenance personnel, the MSDRS monitors for low fluids

data independent of the mission computer system. Maintenance personnel manually activate the MSDRS to display stored maintenance codes.

6. The MSDRS receives inputs from these non-avionic systems and subsystems:

a. AC power system

b. aircraft mounted accessory drive (AMAD)

c. air cycle air conditioning system

d. arresting gear system

e. APU system

f. avionics cooling system

g. bleed air leak detection system

h. bleed air system

i. boarding ladder

j. cabin cooling and anti-fog system

k. canopy system

l. DC power system

m. engines

n. engine feed system

o. engine anti-icing system

p. external fuel system

q. fire extinguishing system

r. fuel low level warning system

s. fuel pressurization and vent system

t. fuel quantity gaging system

u. gun system

v. hot fuel recirculation system

w. hydraulic system

x. inflight refueling system

y. inlet bleed air door system

z. Landing gear system

aa. oxygen system

ab. pitot static system

ac. radar liquid cooling system

ad. speed brake system

ae. vent suit system

af. wheelbrake and anti-skid system

ag. windshield anti-ice and rain removal system

ah. wingfold system

7. The MSDRS receives inputs from these avionic systems:

a. mission computer system

b. electrical boresight compensation system

8. The MSDRS supplies outputs to the systems below:

a. mission computer system

b. electrical boresight compensation system

c. intercommunication and audio system

9. The MSDRS does two types of built-in tests (BIT) to report unit failures:

a. periodic BIT

b. initiated BIT

10. SYSTEM COMPONENTS.

11. **SIGNAL DATA RECORDING SET AN/ASM-612.** The Signal Data Recording Set AN/ASM-612 is made up of the components below:

a. Signal Data Converter CV-3493/ASM-612 (converter)

b. Signal Data Recorder RO-508/ASM-612 (recorder)

c. Magnetic Tape Cartridge MX-9972/ASM-612 (cartridge)

d. Digital Display Indicator ID-2150/ASM-612 (nose wheelwell DDI)

e. Mission Data Loader MU-1053/A After F/A-18 AFC 253 or F/A-18 AFC 292 and F/A-18 AFC 225)

f. Mission Data Loader Mount CP-2092(P)/A (162394 thru 163175 After F/A-18 AFC 253 or F/A-18 AFC 292)

12. The recorder, converter and nose wheelwell DDI are connected by a 100 kHz multiplex (mux).

13. **Signal Data Converter CV-3493/ASM-612.** The converter does the below:

a. Receives analog data from engine sensors and discrete data from other non-avionic systems.

b. Converts data from analog or discrete form 16 bit digital data words.

c. Sends digital data over MSDRS mux to recorder.

d. Supplies excitation voltage to and receives airframe fatigue strain data from aircraft fatigue strain gages.

14. **Signal Data Recorder RO-508/ASM-612.** The recorder does the below:

a. Receives serial digital data from converter and discrete data from non-avionic systems.

b. Converts discrete data to 16 bit digital data.

c. Holds data in temporary storage until requested by mission computer system.

d. Receives and processes data from mission computer system as below:

(1) Holds data to be recorded in temporary storage until full. Transfers data to cartridge on command from mission computer system.

(2) Receives maintenance codes from mission computer system as failures occur. Stores codes in memory and sends codes to nosewheel DDI for storage and display.

e. Controls cartridge drive electronics.

f. Sends power to cartridge, converter, and nose wheelwell DDI.

15. **Magnetic Tape Cartridge MX-9972/ ASM-612.** The MSDRS records data on the magnetic tape cartridge. When full, the cartridge is removed and taken to a ground station where the data is removed from the tape and recorded for permanent storage. The blank cartridge is reinstalled in the aircraft. The cartridge does the below:

a. Receives processed digital data from recorder.

b. Stores digital data on 90 feet of four track magnetic tape.

16. **Digital Display Indicator ID-2150/ASM-612.** The nose wheelwell DDI does the below:

a. Receives and stores maintenance codes from recorder.

b. Provides for manual activation of MSDRS to do a fluids level test of these consumable fluids:

(1) left engine oil

(2) right engine oil

(3) left AMAD oil

(4) right AMAD oil

(5) APU oil

(6) radar liquid cooling system liquid

(7) fire extinguisher fluid

c. Provides a visual display of stored maintenance codes on operator request.

d. Nose wheelwell DDI built-in test/reset resulting in the clearing of all stored maintenance codes from nose wheelwell DDI, recorder, and mission computer system.

17. **Mission Data Loader MU-1053/A.** On F/A-18 after F/A-18 AFC 253 or F/A-18 AFC 292 and

F/A-18 AFC 225, the MDL is a programmable digital computer which serves as a non-volatile solid state memory device. The MDL is a plug-in unit which is cockpit mounted. The MDL communicates with the MC system. The MDL stores and loads programs without interfering the normal operation.

18. ON F/A-18 162394 THRU 163175 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), the MDL provides the ability to load mission initialization files and bulk data into the MC from the MUMI format page as below:

a. HARM

b. RADAR

c. TCN (Tacan)

d. WYPT (Waypoint/OAP)

e. S/S (Sequential Steering)

f. OCS (Overlay Controlled Stores)

g. IFF (Identify Friend or Foe)

h. DL13 (Data Link/ID)

i. MORE (Transfers to the MUMI Weapons Initialization Options)

j. ALR-67

k. GPS ALM

l. GPS WYPT

m. ON F/A-18 162394 THRU 163175 AFTER F/A-18 AFC 292 CIT

19. ON F/A-18 162394 THRU 163175 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), the MDL provides the ability to load Weapons initialization files from the MUMI Weapons Initialization page as below:

a. JSOW

b. JDAM

c. SLMR

d. FLRP (Flight Link Reference Point)

e. WIND

f. AMRAAM

20. On F/A-18 after F/A-18 AFC 253 or F/A-18 AFC 292 and F/A-18 AFC 225, automatic loading is done at power-up, manual loading is done using the MDL mission initialization (MUMI) display.

21. **Mission Data Loader Mount CP-2092(P)/A.** On F/A-18 after F/A-18 AFC 253 or F/A-18 AFC 292 and F/A-18 AFC 225, the MDL mount provides a mounting receptacle for the MDL. The MDL mount provides the electrical interface between the MDL and aircraft wiring.

22. **FATIGUE STRAIN GAGES.** Two fatigue strain gages are bonded to the airframe at seven locations:

a. left wing (near root)

b. left wing (near fold)

c. forward fuselage (drag brace support)

d. right horizontal stabilator (near root)

e. left horizontal stabilator (near root)

f. right vertical stabilizer (near root)

g. left vertical stabilizer (near root)

23. At each location one strain gage functions as the primary strain gage. Its wires are spliced to aircraft wiring. The other strain gage functions as a backup. Its wires are capped and stowed. The strain gages:

a. receive 10vdc excitation voltage from the converter.

b. sense airframe fatigue strain.

c. produce an output proportional to the amount of strain sensed.

d. send the fatigue strain data through the converter to the recorder.

24. The recorder sends the fatigue strain data to the mission computer system. The mission computer system processes the data. When a strain reversal of 10 percent or greater occurs, the mission computer system commands the recorder to record the fatigue strain data and selected tactical data on the cartridge tape.

25. A defective strain gage is determined by analyzing the strain data recorded on the cartridge tape and doing resistance tests. When the strain data recorded indicates a primary strain gage is defective, its wires are removed from the splice, capped, and stowed. The backup strain gage wires are then spliced to the aircraft wiring. When both strain gages at any location are determined to be defective, the strain input from that location to the converter must be temporarily disabled. This is to prevent filling the cartridge with too much fatigue strain data. Both strain gages at that location must be replaced.

26. RELATED SYSTEMS.

27. **MISSION COMPUTER SYSTEM.** The recorder sends digital data by way of avionic mux channel 1 to the mission computer system digital data computer no. 1 (computer). The computer compares the input data to programmed parameters and uses them individually or combined with other inputs to compute maintenance codes, cautions, and advisories. When the computer detects a failure, it sends the applicable maintenance code through the recorder to the nose wheelwell DDI for storage and display.

28. If the computer detects a caution condition, it sends a command through the Control-Converter C-10382/A to the LH advisory and threat warning indicator panel to light the master caution light.

29. **MULTIPURPOSE DISPLAY GROUP.** When the mission computer system detects a caution or advisory condition, it sends the applicable caution/advisory message to the multipurpose display group. The left Digital Display Indicator IP-1317( ), and on F/A-18B, the rear left Digital Display Indicator IP-1318( ) receive and display the caution/advisory messages.

30. Pressing the right Digital Display Indicator IP-1317( ) and on F/A-18/B, the rear right Digital Display Indicator IP-1318( ) BIT control display SDRS pushbutton switch starts the MSDRS built-in test. The BIT control display SDRS BIT status line displays the MSDRS built-in test result.

31. **INTERCOMMUNICATION AND AUDIO SYSTEM.** When the computer detects a caution condition, it sends a command through the recorder to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or AFC 292, AM-7539/A to produce a master caution tone in the headsets.

32. If the detected caution condition has a related voice alert, the mission computer system sends the applicable voice alert command to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or AFC 292, AM-7539/A to produce the applicable voice alert in the headset. The master caution tone is not produced.

33. SYSTEM CONTROLS AND INDICATORS.

34. The maintenance status display and recording system control and indicator functions are listed in table 1 and shown in WP004 00.

Table 1. Control and Indicator Functions

Control/Indicator	Function
1. Digital Display Indicator ID-2150/ASM-612	
a. MAINTENANCE CODE DISPLAY switch	Pushbutton switch. Starts display of stored maintenance codes on MAINTENANCE CODE display.
b. FLUIDS CHECK switch	Pushbutton switch. Starts fluids level test of consumable fluids.

Table 1. Control and Indicator Functions (Continued)

Control/Indicator	Function
c. DDI BIT/RESET switch	Guarded pushbutton switch. Starts nose wheelwell DDI built-in test. Clears maintenance codes from nose wheelwell DDI memory if BIT is satisfactorily completed.
d. MAINTENANCE CODE display	Three digit light-emitting diode display. Displays maintenance codes stored in nose wheelwell DDI when MAINTENANCE CODE DISPLAY switch is pressed.
e. DDI FAIL indicator	Latch type fault indicator. Sets to fault (black and white) when failure is detected in nose wheelwell DDI.
f. FLUIDS LOW indicator	Latch type fault indicator. Set to fault (black and white) to indicate fluids level test completion and to verify FLUIDS CHECK functioned correctly.
g. WPN SYS FAIL indicator	Latch type fault indicator. Sets to fault (black and white) when failed unit maintenance codes are stored in nose wheelwell DDI.
h. TOTAL HRS meter	Indicates unit total operating time in hours.
2. Signal Data Converter CV-3493/ASM-612	
a. Total time meter	Indicates unit total operating time in hours.
b. Fault indicator	Latch type fault indicator. Sets to fault (black and white) if failure is detected in converter.
3. Signal Data Recorder RO-508/ASM-612	
a. Total time meter	Indicates unit total operating time in hours.
b. Fault indicator	Latch type fault indicator. Sets to fault (black and white) if failure is detected in recorder.
4. Magnetic Tape Cartridge MX-9972/ASM-612	
a. Total time meter	Indicates unit total operating time in hours.

Table 1. Control and Indicator Functions (Continued)

Control/Indicator	Function
b. Fault indicator	Latch type fault indicator. Sets to fault (black and white) if failure is detected in cartridge.
4A. APU control panel	
a. APU control switch	Sends APU start ground discrete to signal data recorder. Puts MSDRS in APU start mode.
b. ENG CRANK switch	Sends engine start ground discrete to signal data recorder. Puts MSDRS in engine start mode.
4B. 2 Intercommunications Amplifier-Control:	
a. CRYPTO Switch	Three position toggle switch spring loaded to NORM. ZERO position sends ground discrete to MDL to erase data stored between specified memory locations. Switch must be pulled out and momentarily set to lower position.
5. GND PWR control panel assembly	
a. 1 switch	
(1) A ON position	Energizes left DC bus powered relay 1K-C111 which sends mission computer system on ground discrete to signal data recorder to put MSDRS in normal mode. Also sends power to Digital Data Computer No. 1, and left Digital Display Indicator IP-1317( ). On F/A-18B, also sends power to rear left Digital Display Indicator IP-1318( ).
(2) B ON position	Energizes left DC bus powered relay 1K-C111 which sends mission computer system on ground discrete to signal data recorder to put MSDRS in normal mode. Also sends power to Digital Data Computer No. 1, Digital Data Computer No. 2, and left Digital Display Indicator IP-1317( ). On F/A-18B, also sends power to rear left Digital Display Indicator IP-1318( ).
b. 2 switch	
(1) A ON position	Sends power to right digital Display Indicator IP-1317( ). For other systems powered by 2 switch, refer to ground power switching description (A1-F18AC-420-100)

Table 1. Control and Indicator Functions (Continued)

Control/Indicator	Function
(2) B ON position	Sends power to right Digital Display Indicator IP-1317( ). For other systems powered by 2 switch, refer to ground power switching description (A1-F18AC-420-100).
6. Left Digital Display Indicator IP-1317( )	
a. SUPT MENU display	
(1) BIT pushbutton switch	Provides BIT control display.
(2) ENG pushbutton switch	Provides engine monitor display.
(3) 2 MUMI pushbutton switch	Provides MDL mission initialization display.
b. BIT control display	
(1) SDRS pushbutton switch	Provides a method to start MSDRS built-in test.
(2) SDRS BIT status line	Displays MSDRS BIT status NOT RDY, RESTRT, IN TEST, DEGD, NO GO, or GO.
c. Engine monitor display	
RECORD pushbutton switch	Provides method to manually command recorder to record selected engine data.
d. 2 MDL Mission Initialization Display (MUMI):	Provides the ability to load mission data files.
(1) WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), HARM, RADAR, TCN, WYPT, S/S, OCS, IFF, DL13, ALR-67, GPS ALM, 3 CIT and GPS WYPT push-button switches.	Initiates individual manual loading of mission data files from the MDL to MC 1.
(2) HOLD push-button switch	Inhibits the erase of the MDL, armament computer, MC 1 and MC 2.
(3) ERASE push-button switch	Initiates the erase of the MDL, armament computer, MC 1 and MC 2.
(4) MC SUSPEND push-button switch	Inhibits or allows the erase of MC 1 and MC 2.
(5) MENU push-button switch	Provides for SUPT menu display.

Table 1. Control and Indicator Functions (Continued)

Control/Indicator	Function
(6) WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000); MORE push-button switch	Provides MUMI Weapons Initialization Display.
e. 2 WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), MUMI Weapons Initialization Display:	Provides the ability to load weapon data files.
(1) JSOW, JDAM, SLMR, FLRP (Fighter Link Reference Point) and WIND push-button switches.	Initiates individual loading of weapon data files from the MDL to MC 1.
(2) RETURN push-button switch	Provides option to return to MUMI top-level display.
(3) MENU push-button switch	Provides SUPT menu display.
f. STATUS MONITOR BIT display:	Indicates BIT status of MSDRS system.
(1) MDL push-button switch	Provides method to start MDL initiated BIT.
(2) MU BIT status line	Display MU BIT status messages.
(3) MENU push-button switch	Provides SUPT menu display.
g. Advisory line	Displays ADV-BIT when an avionic system failure occurs.
h. Caution line	Displays CAUT DEGD when a MSDRS failure occurs.
7. Right Digital Display Indicator IP-1317( )	Provides same functions described for left Digital Display Indicator IP-1317( ).
8. Rear left or right Digital Display Indicator IP-1318( ) - TF/A-18A.	Provides same functions described for left Digital Display Indicator IP-1317( ). Driven by related left or right cockpit Digital Display Indicator IP-1317( ).
9. 1 MMP ENABLE/BRCU switch	Provides five minutes of nose wheelwell DDI operation when momentarily set to RESET if external power is not applied or generators are not operating.

1 163119 AND UP; ALSO ON 161353 THRU 163118 AFTER F/A-18 AFC 90.

2 ON F/A-18A 162394 THRU 163175 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292.

3 ON F/A-18A 162394 THRU 163175 AFTER F/A-18 AFC 292.

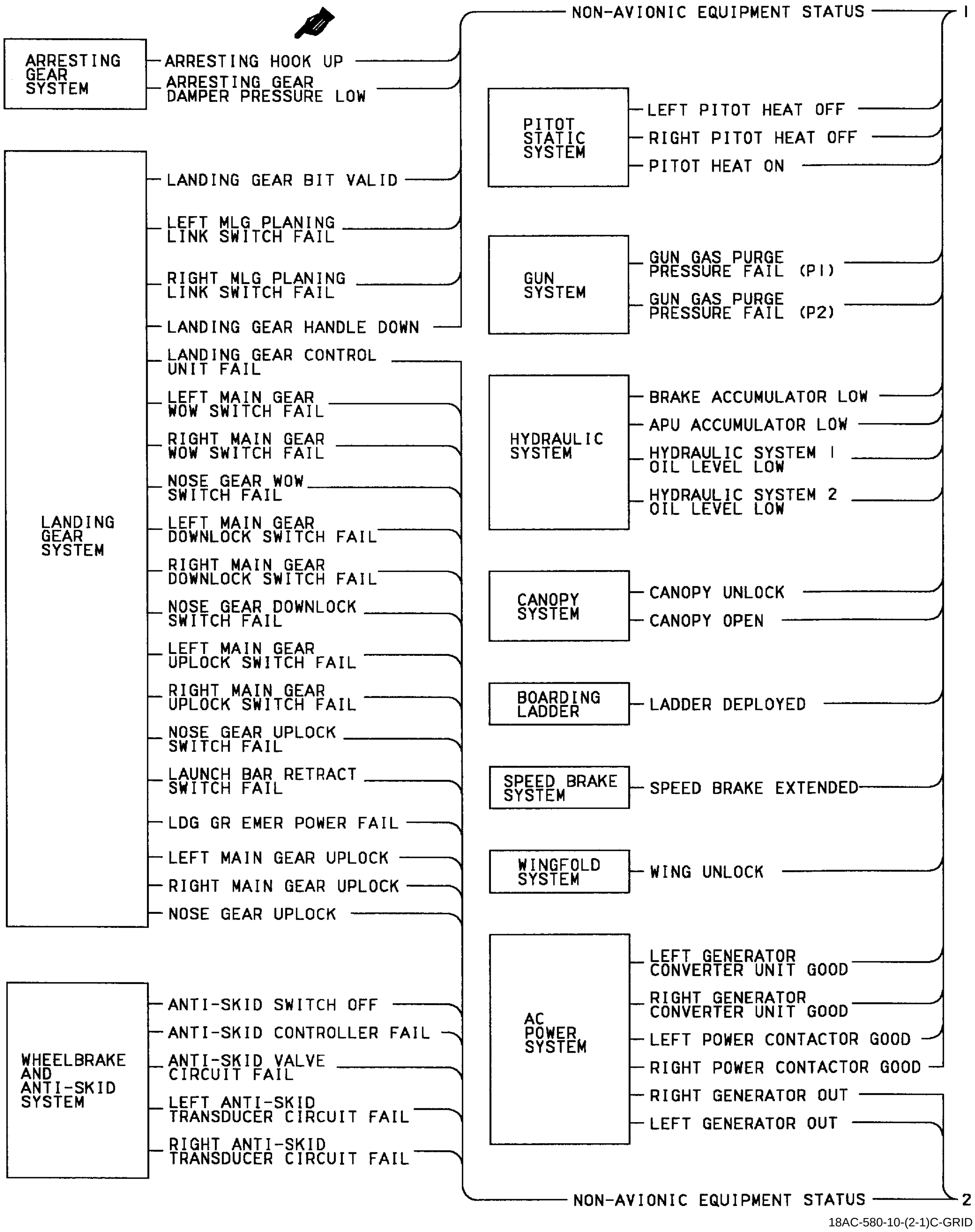


Figure 1. Simplified Block Diagram (Sheet 1)

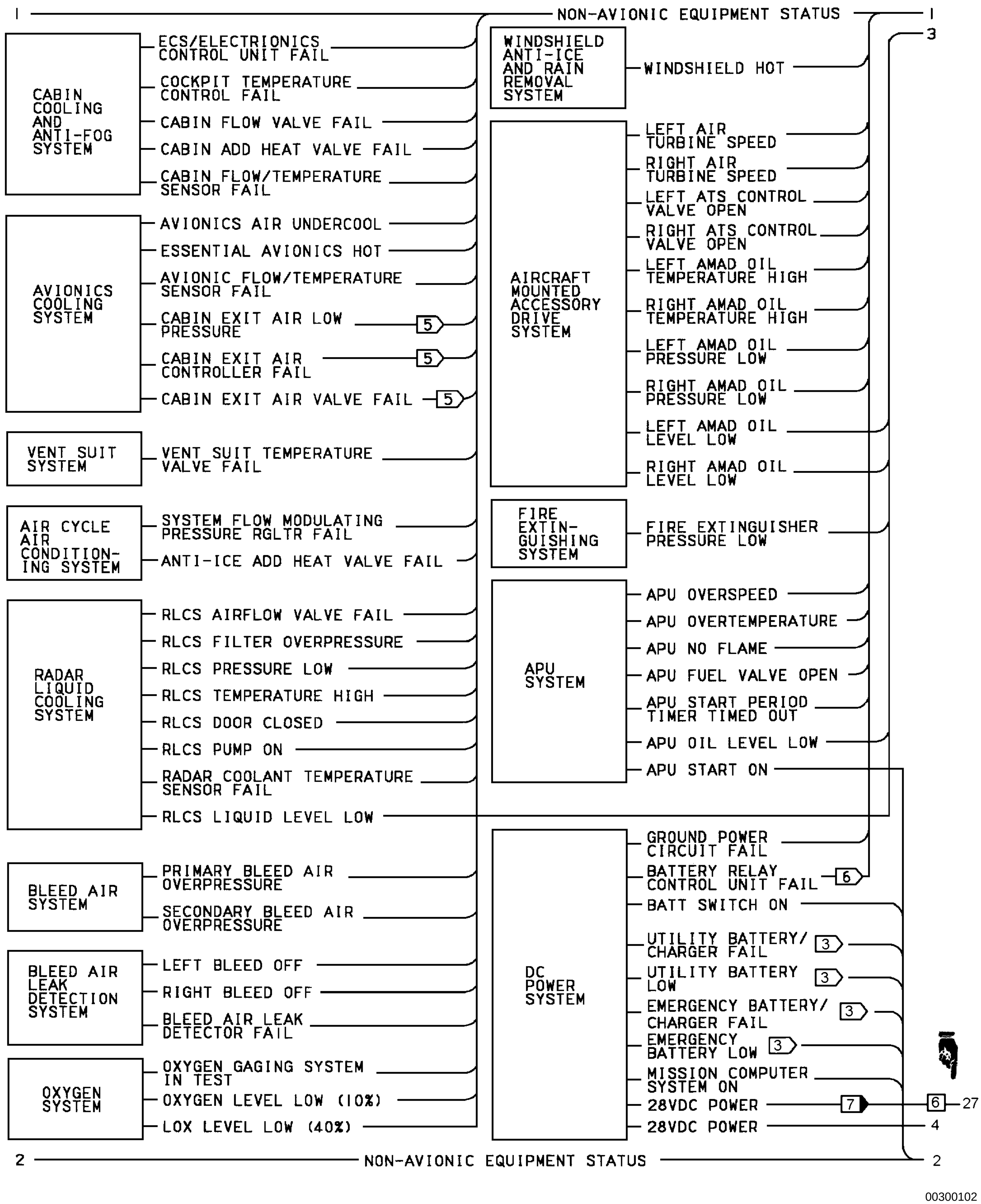


Figure 1. Simplified Block Diagram (Sheet 2)

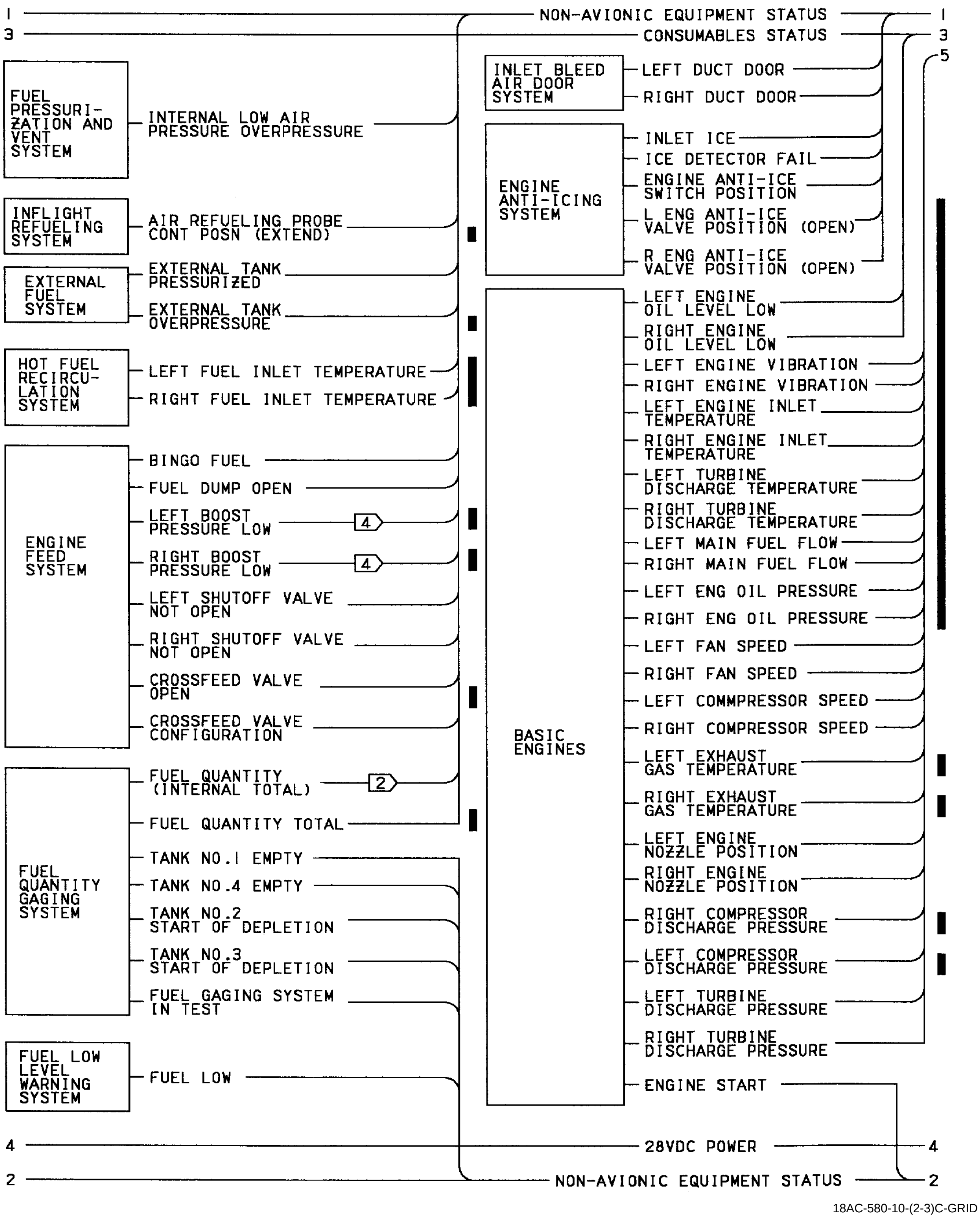
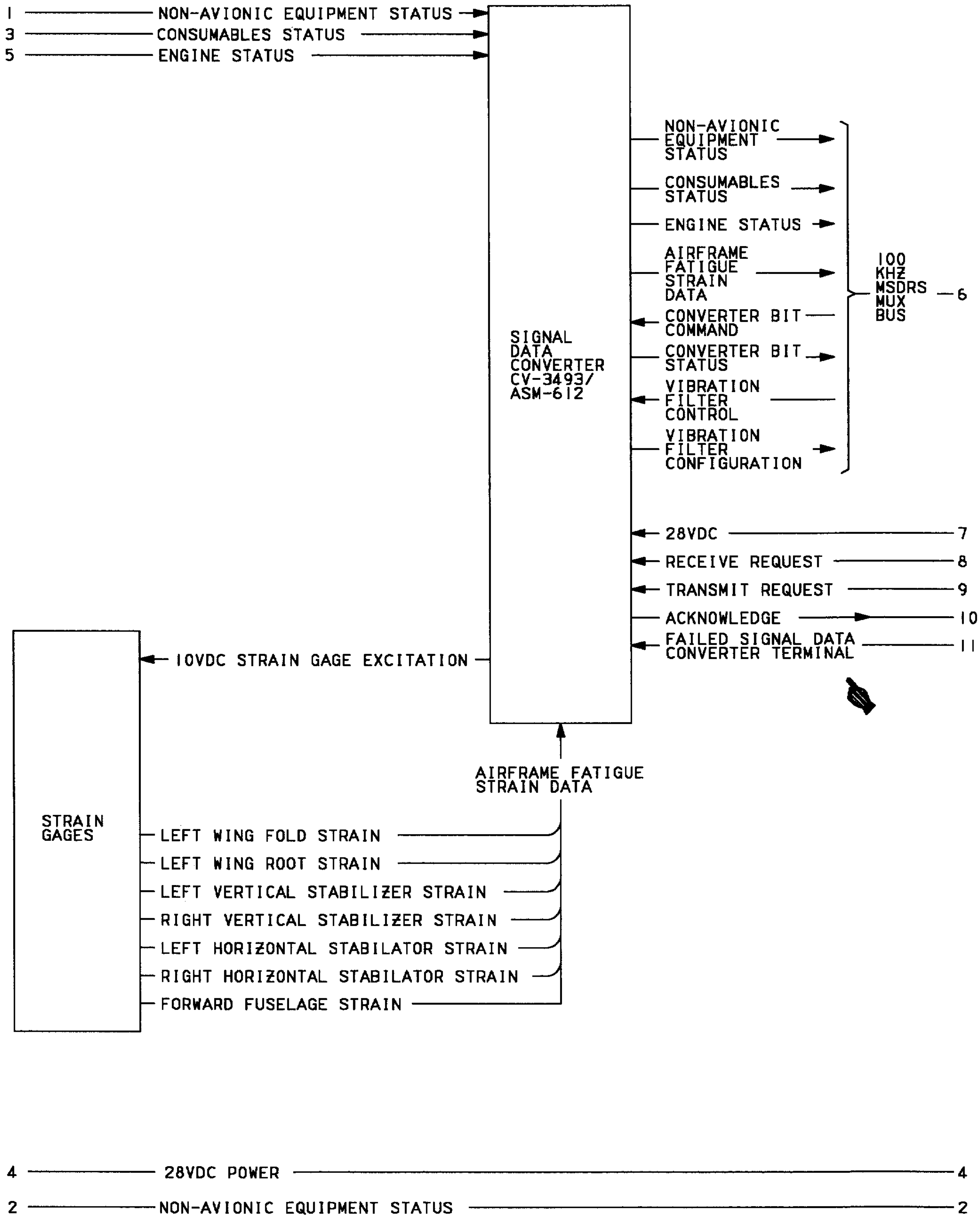


Figure 1. Simplified Block Diagram (Sheet 3)



18AC-580-10-(2-4)C-GRID

Figure 1. Simplified Block Diagram (Sheet 4)

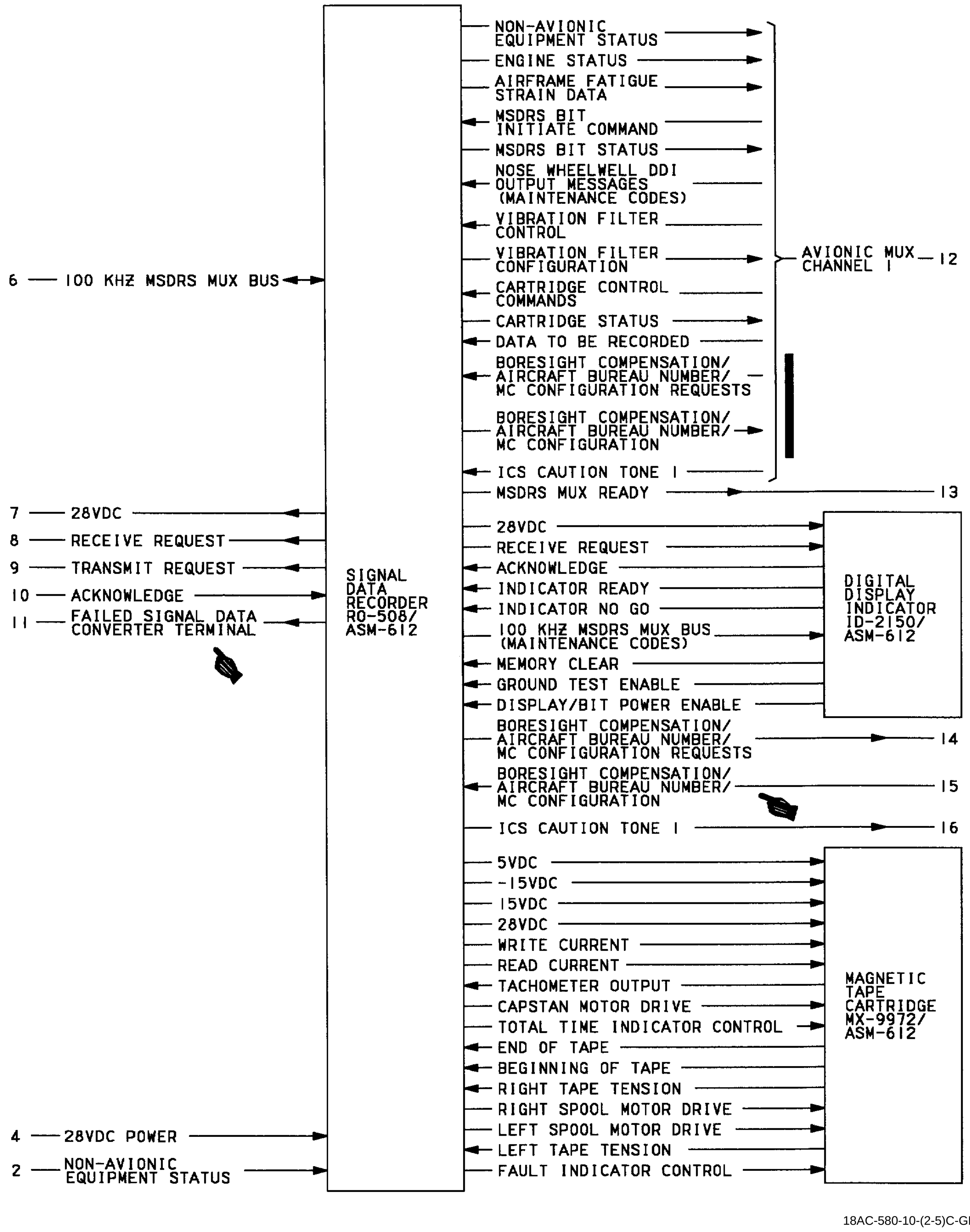


Figure 1. Simplified Block Diagram (Sheet 5)

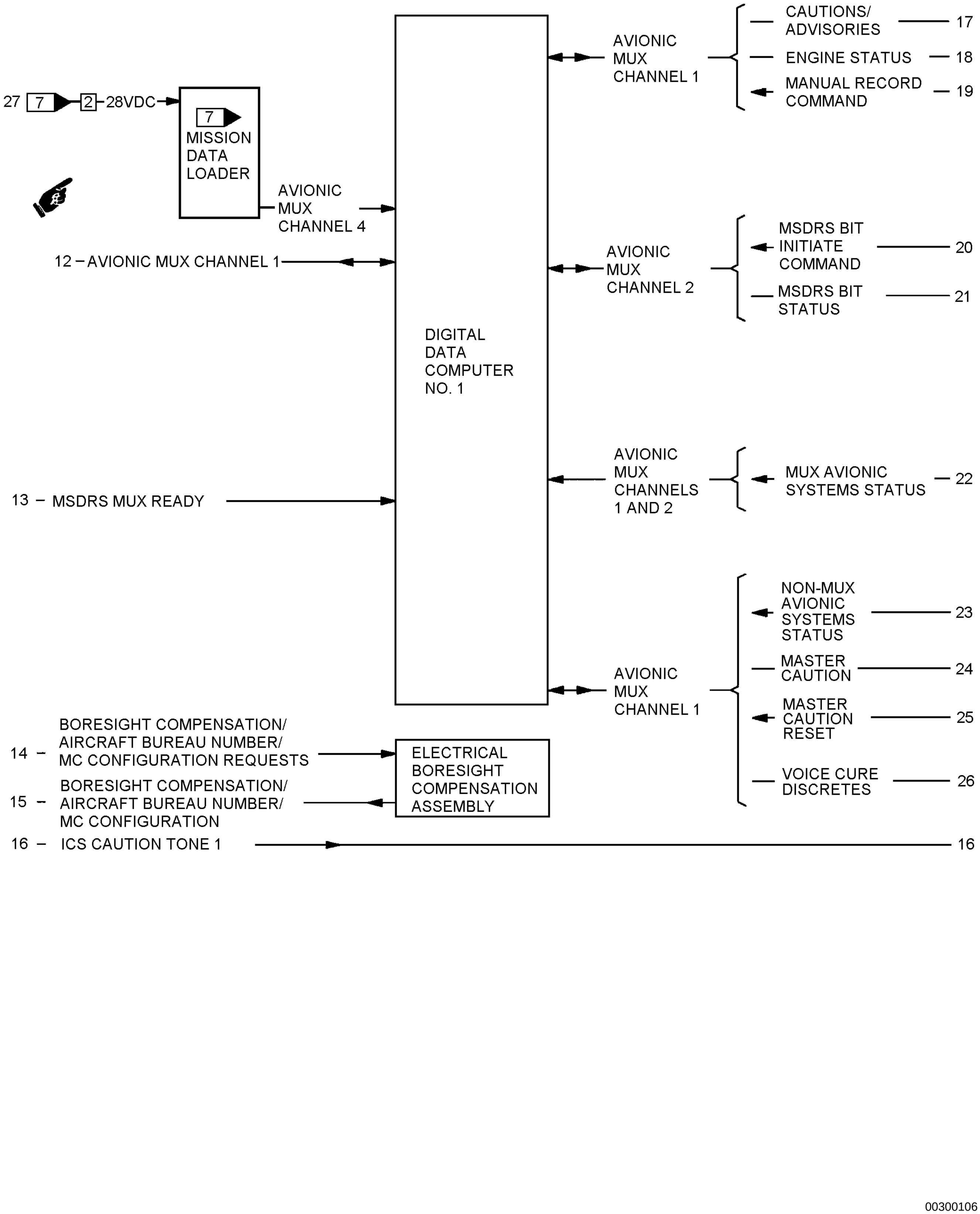
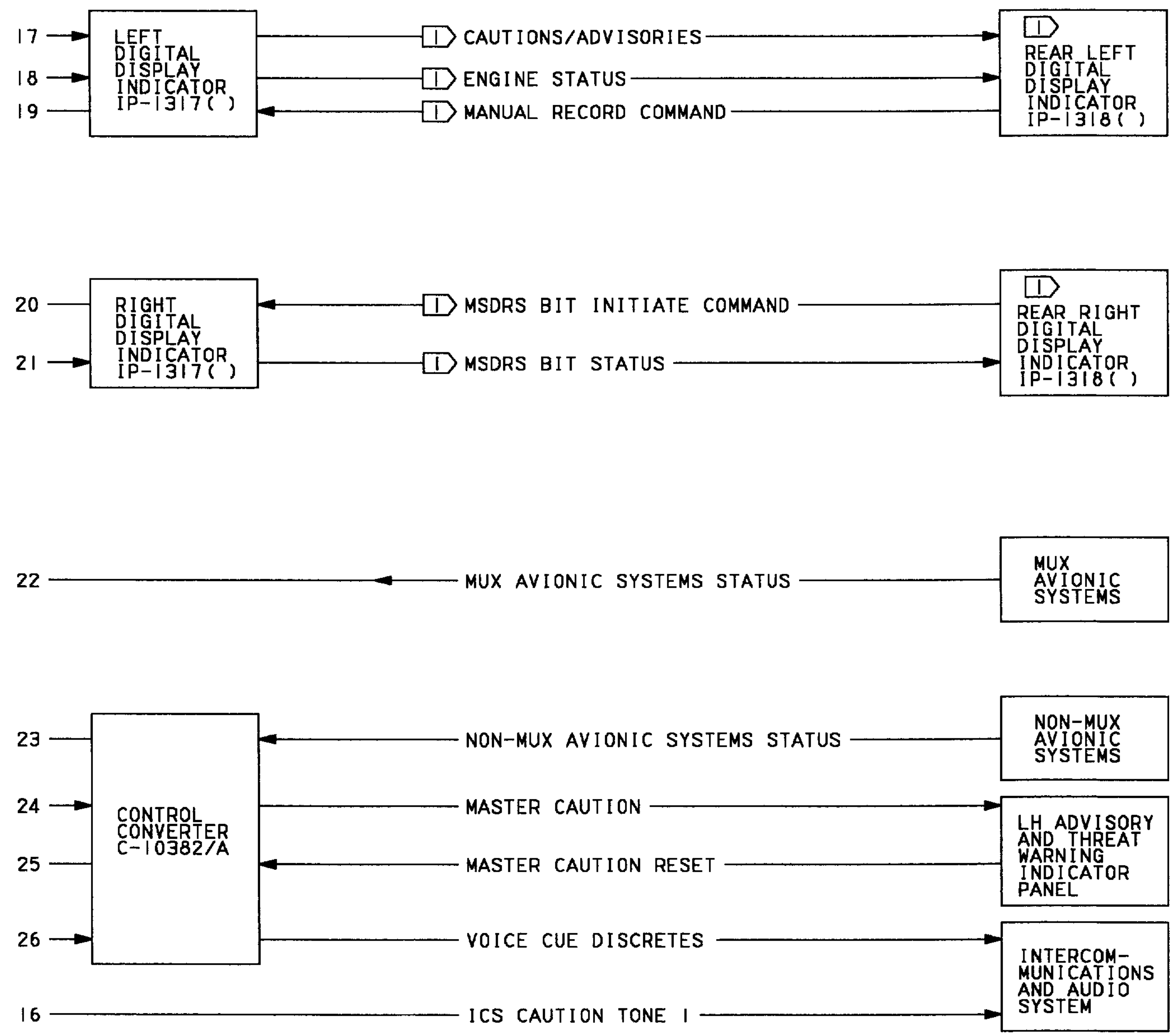


Figure 1. Simplified Block Diagram (Sheet 6)



LEGEND

1 F/A-18B.

2 161353 THRU 161519 BEFORE F/A-18 AFC 39.

3 161353 THRU 161528 BEFORE F/A-18 AFC 49.

4 163119 AND UP; ALSO 161353 THRU 161924 BEFORE F/A-18 IAFC 056, OR 161353 THRU 163118 AFTER F/A-18 AFC 70.

5 163092 AND UP.

6 163119 AND UP; ALSO ON 161353 THRU 163118 AFTER F/A-18 AFC 90.

7 F/A-18 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 AND F/A-18 AFC 225.

00300107

Figure 1. Simplified Block Diagram (Sheet 7)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

COMPONENT LOCATOR

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP004 00, dated 1 October 2000.

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 90	-	GFE Battery Relay Control Unit; Incorporation of (ECP MDA-F/A-18-00166R1)	1 Aug 88	ECP Coverage Only
F/A-18 AFC 253	-	U.S. Naval Reserves A^{+} Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^{+} Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

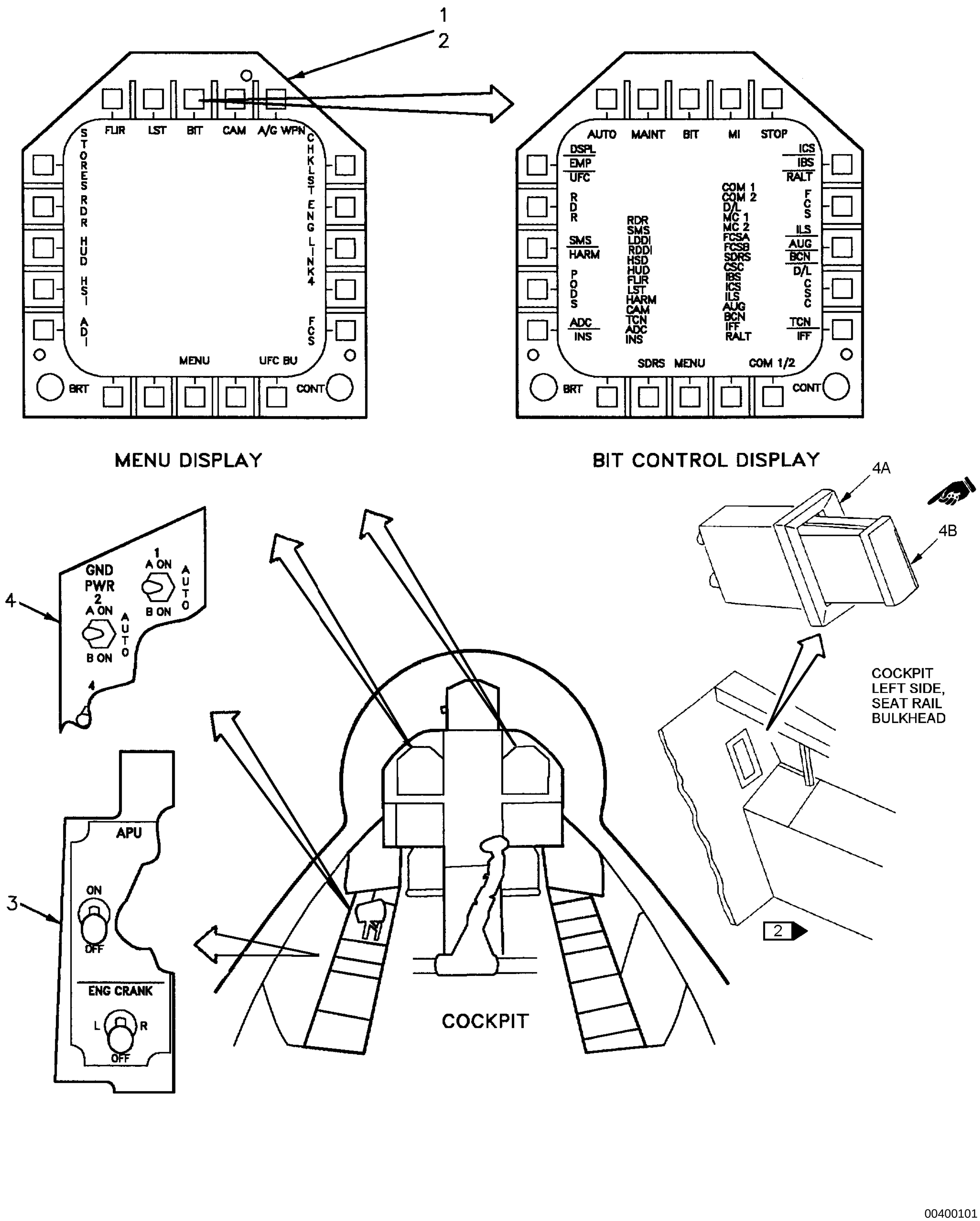


Figure 1. Component Locator (Sheet 1)

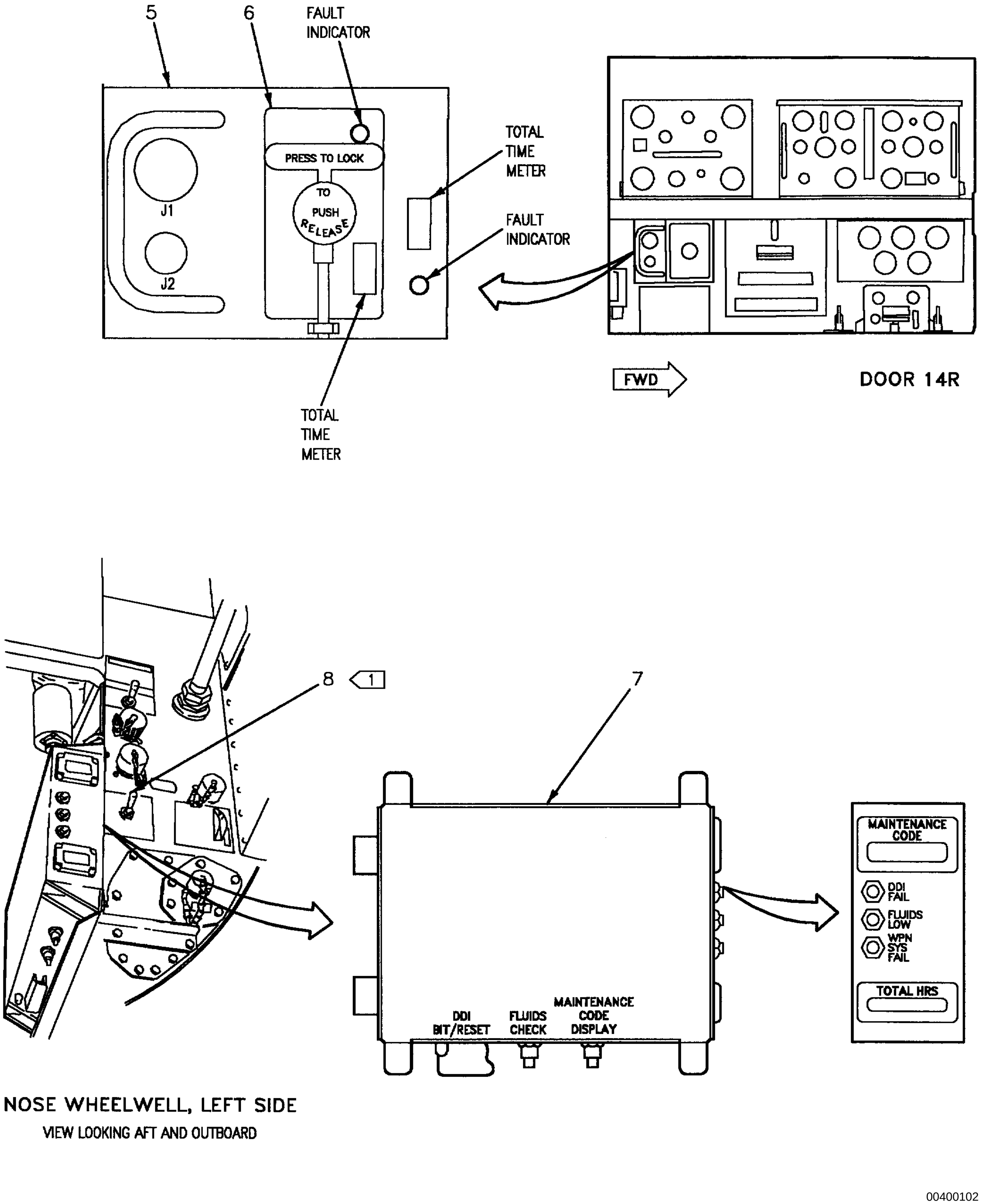
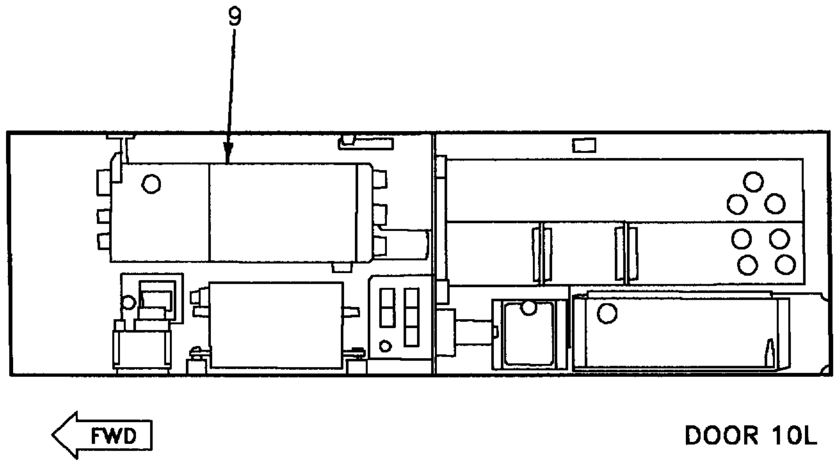
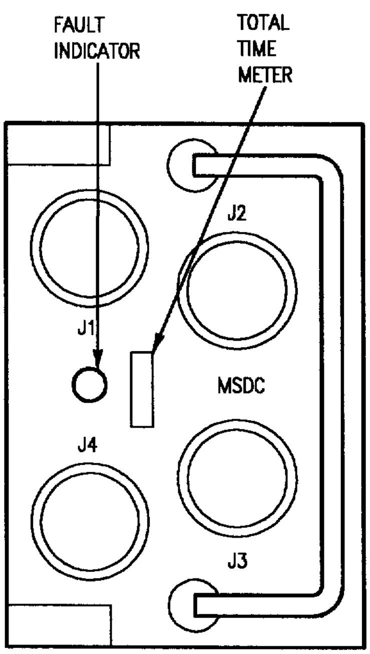
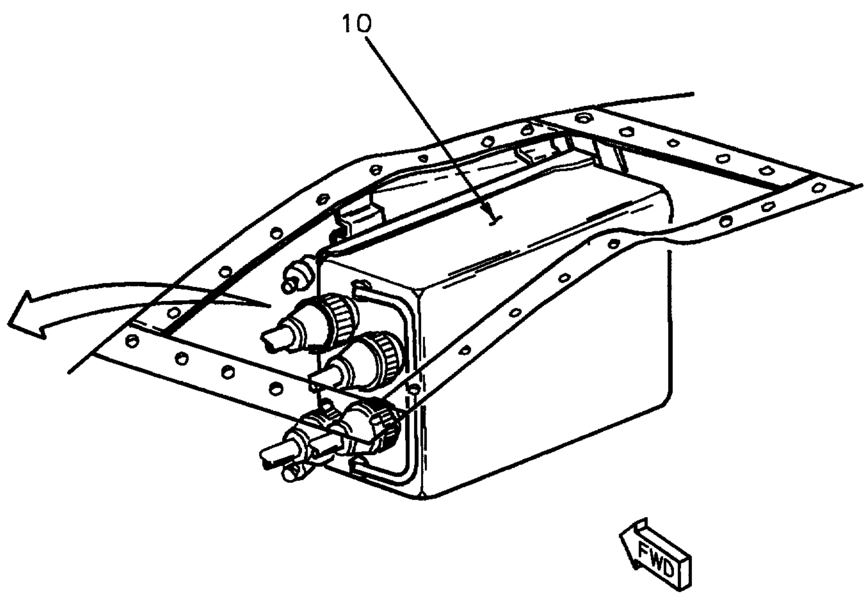


Figure 1. Component Locator (Sheet 2)

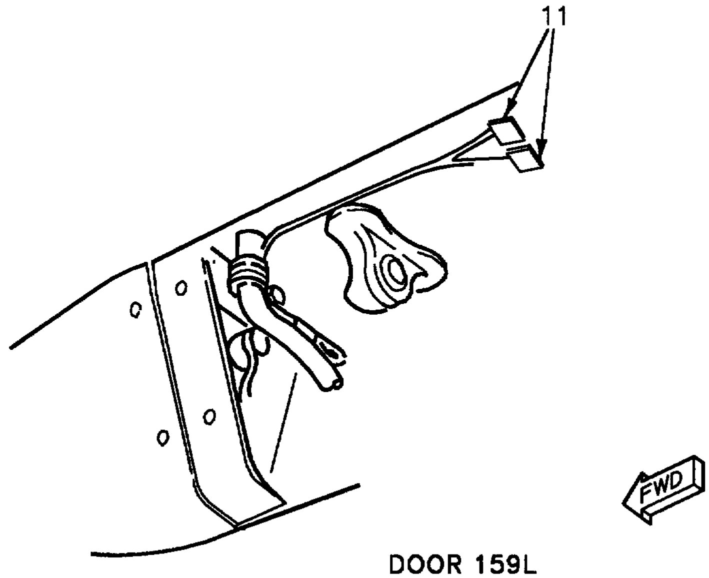






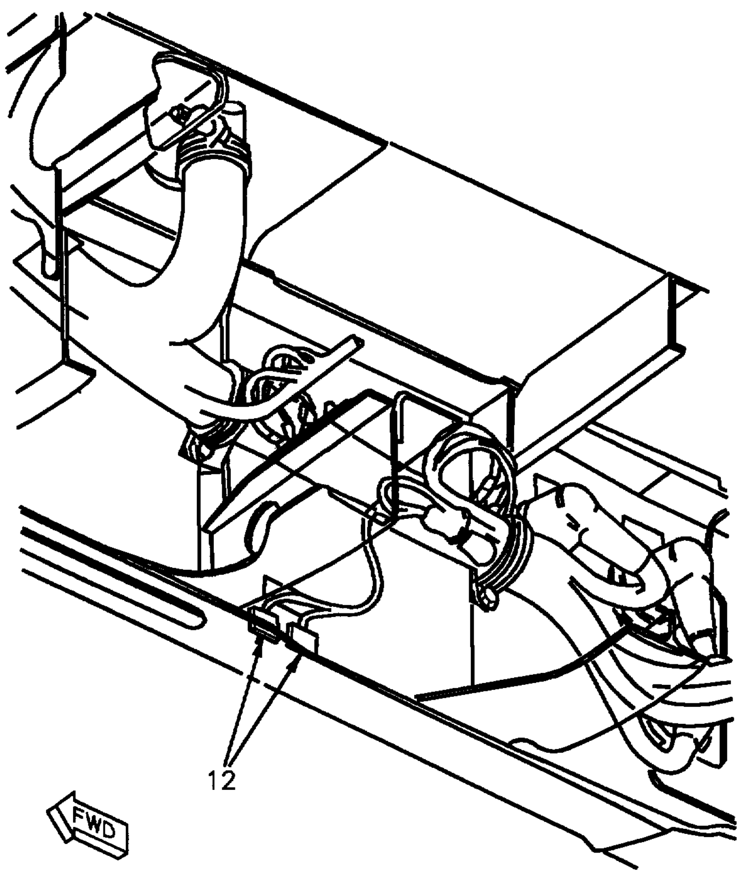
00400103

Figure 1. Component Locator (Sheet 3)



DOOR 159L

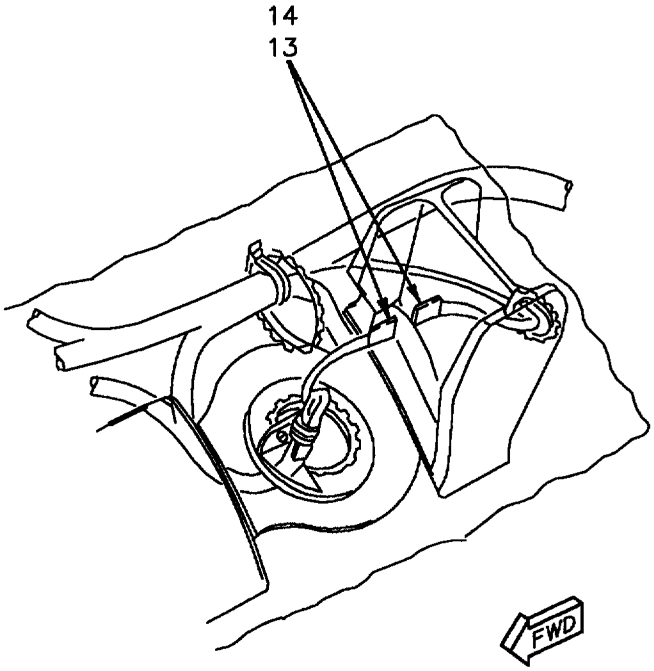
LEFT WING TIP COMMAND SIGNAL
ENCODER-DECODER KY-851/AYQ-9(V)
REMOVED FOR CLARITY



VIEW THRU DOOR 108

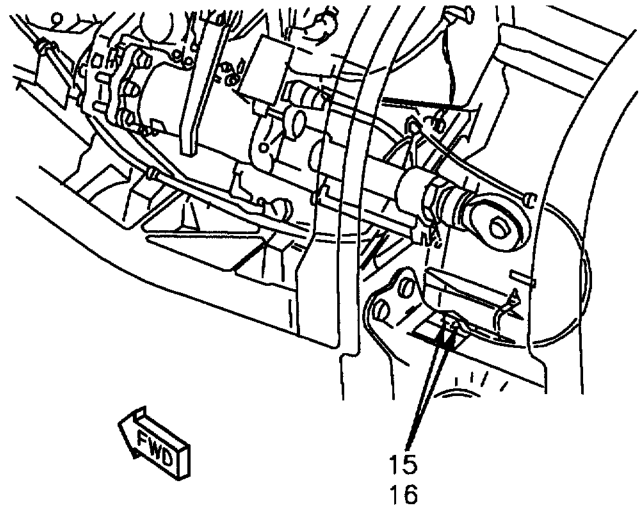
00400104

Figure 1. Component Locator (Sheet 4)



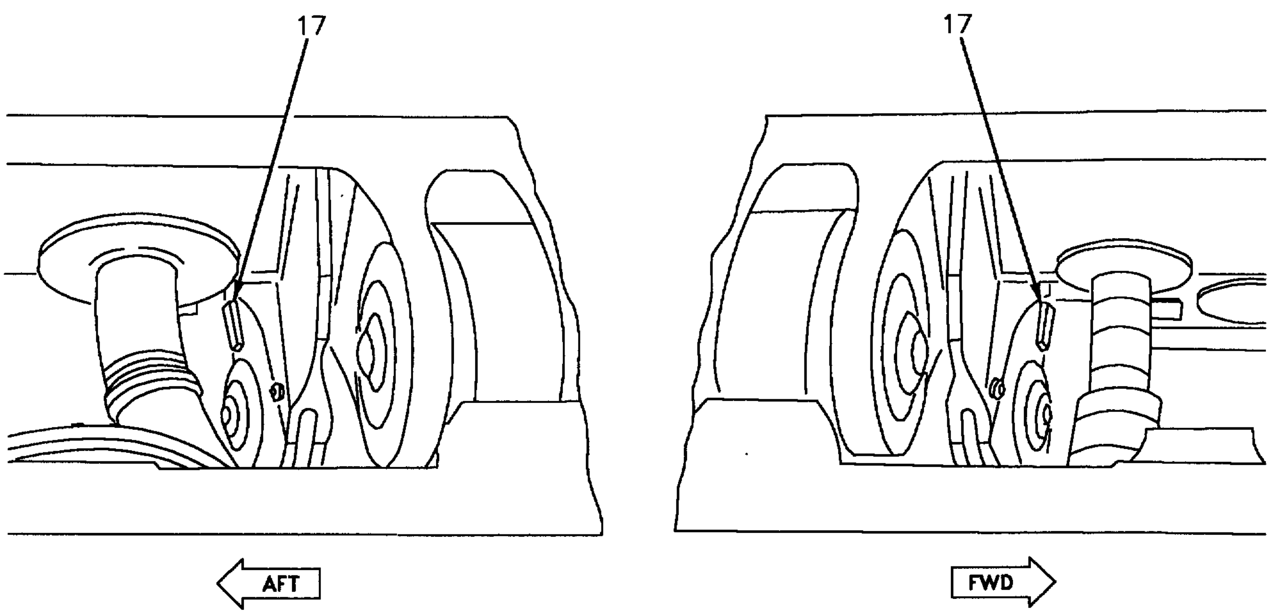
DOOR 88L/R

LEFT SIDE SHOWN
RIGHT SIDE TYPICAL



DOOR 72L/R

LEFT SIDE SHOWN
RIGHT SIDE TYPICAL



DOOR 41L

VIEW LOOKING DOWN AND OUTBOARD

00400105

Figure 1. Component Locator (Sheet 5)

NOMENCLATURE	INDEX NO.	REF DES
APU CONTROL PANEL	3	52A-H079
DIGITAL DISPLAY INDICATOR ID-2150/ASM-612	7	85A-G003
DRAG BRACE SUPPORT STRAIN GAGE	12	85M-F019
GND PWR CONTROL PANEL ASSEMBLY	4	1A-H004
LEFT DIGITAL DISPLAY INDICATOR IP-1317( )	1	80A-H001
LEFT HORIZONTAL STABILATOR STRAIN GAGE	15	85M-S013
LEFT VERTICAL STABILIZER STRAIN GAGE	14	85M-S011
LEFT WING FOLD STRAIN GAGE	11	85M-U021
LEFT WING ROOT STRAIN GAGE	17	85M-U020
MAGNETIC TAPE CARTRIDGE MX-9972/ASM-612	6	85A-F501
2 MISSION DATA LOADER (MDL) MU-1053/A	4B	85A-K503
2 MISSION DATA LOADER MOUNT CP-2092(P)/A	4A	85A-K040
1 MMP ENABLE/BRCU SWITCH	8	1S-G160
2 MU CIRCUIT BREAKER (A7)		85CBC045
NO. 8 CIRCIUT BREAKER/RELAY PANEL ASSEMBLY MSDRS CIRCUIT BREAKER (D2)	9	52A-C159 85CBC004
RIGHT DIGITAL DISPLAY INDICATOR IP-1317( )	2	80A-J002
RIGHT HORIZONTAL STABILATOR STRAIN GAGE	16	85M-T012
RIGHT VERTICAL STABILIZER STRAIN GAGE	13	85M-T010
SIGNAL DATA CONVERTER CV-3493/ASM-612	10	85A-N002
SIGNAL DATA RECORDER RO-508/ASM-612	5	85A-F001

LEGEND

1 F/A-18 161353 THRU 163118 AFTER F/A-18 AFC 90

2 F/A-18A 162394 THRU 163179 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292;
ALSO F/A-18A/B AFTER F/A-18 AFC 225

Figure 1. Component Locator (Sheet 6)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

OPERATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 90	-	GFE Battery Relay Control Unit; Incorporation of (ECP MDA-F/A-18-00165R1)	1 Aug 88	ECP Coverage Only
F/A-18 AFC 253	-	U.S. Naval Reserves A^{+} Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^{+} Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

1. INTRODUCTION.

2. The maintenance status display and recording system (MSDRS) operations are:

a. power requirements.

b. 100 kHz MSDRS mux bus.

c. data acquisition.

d. data processing.

e. Digital Display Indicator ID-2150/ASM-612 interface (WP013 00).

f. built-in test (WP015 00).

g. data storage (WP024 00) F/A-18 162394 thru 163175 after F/A-18 AFC 253 or F/A-18 AFC 292; also F/A-18A/B after F/A-18 AFC 225.

3. POWER REQUIREMENTS.

4. See WP006 00. The MSDRS requires 28vdc for operation. The aircraft maintenance bus sends 28vdc through no. 8 circuit breaker/relay panel assembly MSDRS circuit breaker 85CBC004.

5. On 161353 THRU 161528 BEFORE F/A-18 AFC 90, MSDRS circuit breaker 85CBC004 sends the 28vdc to Signal Data Recorder RO-508/ASM-612 (recorder) deenergized relays A13K1 and A13K2.

6. On 161702 THRU 163118 BEFORE F/A-18 AFC 90, MSDRS circuit breaker 85CBC004 sends the 28vdc through deenergized relay 83K-C014 to recorder deenergized relays A13K1 and A13K2.

7. On 163119 AND UP; ALSO 161353 THRU 163118 AFTER F/A-18 AFC 90, MSDRS circuit breaker 85CBC004 sends the 28vdc through no. 7 circuit breaker/relay panel assembly energized relay 1K-C154. Energized relay 1K-C154 sends 28vdc through no. 8 circuit breaker/relay panel assembly deenergized relay 83K-C014. Deenergized relay 83K-C014 sends 28vdc to recorder deenergized relays A13K1 and A13K2.

8. When A13K1 energizes, it sends 28vdc to the recorder and Signal Data Converter CV-3493/ASM-612 (converter) power supplies. The power supplies develop the voltages required by the modules in each unit. When relay A13K2 energizes, it sends 28vdc to the nose wheelwell Digital Display Indicator ID-2150/ASM-612 (nose wheelwell DDI) power supply. When recorder relay A13K4 energizes, the recorder power supply sends power to the Magnetic Tape Cartridge MX-9972/ASM-612 (cartridge).

9. 100 KHZ MSDRS MUX BUS.

10. See WP006 00. The 100 kHz MSDRS multiplex bus (MSDRS mux) connects the recorder, converter, and nose wheelwell DDI. The recorder controls all communication on the MSDRS mux. The converter receives and transmits data by way of the MSDRS mux. The nose wheelwell DDI only receives data by way of the MSDRS mux. The MSDRS mux operations are:

a. Data transmitted from converter.

b. Data transmitted to converter.

c. Data transmitted to nose wheelwell DDI.

11. **DATA TRANSMITTED FROM CONVERTER.** The converter sends data to the recorder as below:

a. Recorder sends transmit request output to converter.

b. Converter sends acknowledge reply to recorder.

c. Converter sends one data bit by way of the MSDRS mux for each clock pulse received from the recorder. After the converter sends 16 data bits (one data word) to the recorder, it sends a final bit representing odd parity for transmission error detection of the previous 16 data bits.

d. If the data word is complete, the recorder removes the transmit request output. This indicates to the converter that data transfer is complete and the recorder has received and stored the data. The converter then removes the acknowledge output.

e. The transmit request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the converter to the recorder.

12. The recorder receives data from the MSDRS mux in a serial binary format. The recorder converts the serial binary data received to a parallel binary format for use. The 16 bit serial data words from the converter contain eight data bits and eight address bits. The recorder stores the data in buffer memory locations as address, data, address, data. Therefore, the recorder requires four eight bit data bytes (two data bytes and two address bytes) to make up each 16 bit word sent by way of the avionic mux bus to digital data computer no. 1.

13. **DATA TRANSMITTED TO CONVERTER.** The recorder sends data to the converter as below:

a. Recorder sends receive request output to converter.

b. Converter sends acknowledge reply to recorder.

c. Recorder sends one data bit by way of the MSDRS mux for each clock pulse transmitted to the converter. After the recorder sends 16 data bits (one data word) to the converter, it sends a final bit representing odd parity for transmission error detection of the previous 16 data bits.

d. If the data word is complete, the recorder removes the receive request output. This indicates data transfer is complete and the converter has received and stored the data. The converter then removes the acknowledge output. If the data word is not complete, the converter rejects the data and momentarily removes the acknowledge output. This indicates to the recorder that the data transmitted to the converter was abnormal. The recorder responds by removing the receive request output from the converter.

e. The receive request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the recorder to the converter.

14. The recorder transmits data by way of the MSDRS mux by converting it from parallel binary data to a serial binary format. The 16 bit serial data words from the recorder contain eight data bits and eight address bits. The converter converts the serial binary data received to a parallel binary format for use. The converter stores the parallel binary data in memory.

15. **DATA TRANSMITTED TO NOSE WHEELWELL DDI.** The recorder sends data to the nose wheelwell DDI as below:

a. Recorder sends receive request output to nose wheelwell DDI.

b. Nose wheelwell DDI sends acknowledge reply to recorder.

c. Recorder sends one data bit by way of the MSDRS mux for each clock pulse transmitted to the nose wheelwell DDI. After the recorder sends 16 data bits (one data word) to the nose wheelwell DDI, it sends a final bit representing odd parity for transmission error detection of the previous 16 data bits.

d. If the data word is complete, the recorder removes the receive request output. This indicates data transfer is complete and the nose wheelwell DDI has received and stored the data. If the data word is not complete, the nose wheelwell DDI rejects the data and momentarily removes the acknowledge output. This indicates to the recorder that the data transmitted to the nose wheelwell DDI was abnormal. The recorder responds by removing the receive request output from the nose wheelwell DDI.

e. The receive request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the recorder to the nose wheelwell DDI.

16. The recorder transmits data by way of the MSDRS mux by converting it from parallel binary data to a serial binary format. The 16 bit serial data words from the recorder contain the data below:

a. maintenance code type (unit fail, fluids low, or test code)

b. maintenance code

c. memory clear command

d. memory clear reset

17. The nose wheelwell DDI converts the serial binary data received to parallel binary data. The nose wheelwell DDI then stores the parallel binary data in memory.

18. **DATA ACQUISITION.**

19. The MSDRS data acquisition operations are:

a. auxiliary power unit (APU) start.

b. engine start.

c. normal.

20. **APU START.** See WP006 00. Setting the APU control switch to ON energizes no. 7 circuit breaker/relay panel assembly relay 2K-C016. This sends an APU start input to the recorder. The recorder power control circuit detects the APU start input and energizes recorder relay A13K1. Energized relay A13K1 sends 28vdc to the recorder and converter power supplies. Activation of the recorder power supply causes the recorder central processing unit (cpu) to scan the inputs. The recorder cpu detects the APU start input. This puts the recorder cpu in the APU start mode. When in the APU start mode, the recorder cpu does the below:

a. Starts APU mode timer.

b. Produces recorder/converter power on command to interlock power if APU start input is removed.

c. Monitors input data from converter for not valid APU inputs.

d. If any APU input is not valid, produces indicator power on command which energizes recorder relay A13K2. Energized relay A13K2 sends 28vdc to nose wheelwell DDI power supply.

e. Puts maintenance codes for any not valid APU inputs in memory. Sends APU maintenance codes to nose wheelwell DDI for storage and display, independent of mission computer system. See WP021 00.

21. Both generators operating deenergizes the APU control switch. This deenergizes no. 7 circuit breaker/relay panel assembly relay 2K-C016 and removes the APU start input from the recorder. The recorder power control circuit detects the removal of the APU start input. The recorder changes to the normal mode, see paragraph 26.

22. **ENGINE START.** See WP006 00. Starting the left engine energizes no. 4 relay panel assembly relay 3K-N004. Energized relay 3K-N004 sends an engine start input through no. 7 circuit breaker/relay panel assembly deenergized relay 3K-C019 to the recorder. Starting the right engine energizes no. 4 relay panel assembly relay 3K-N005. Energized relay 3K-N005 sends an engine start input through no. 7 circuit breaker/relay panel assembly deenergized relay 3K-C020 to the recorder.

23. The recorder power control circuit detects the engine start input and energizes recorder relay A13K1. Energized relay A13K1 sends 28vdc to the recorder and converter power supplies. Activation of the recorder power supply causes the recorder cpu to scan the inputs. The recorder cpu detects the engine start input. This puts the recorder cpu in the engine start mode. When in the engine start mode, the recorder cpu does the below:

a. Starts engine start mode timer.

b. Produces recorder/converter power on command to interlock power if engine start input is removed.

c. Produces cartridge power on command which energizes recorder relay A13K4 which sends power to the cartridge.

d. Commands cartridge to record compressor speed and exhaust gas temperature for 60 seconds.

24. The mission computer system starts operation when the first engine started reaches idle speed. The MSDRS remains in the engine start mode for the remainder of the 60 second engine start period. At the end of the 60 seconds, the MSDRS changes to the normal mode. Data from the second engine started is not recorded, but is monitored for abnormalities by the mission computer system.

25. Engine start cycle completion deenergizes no. 4 relay panel assembly relays 3K-N004 and 3K-N005. This removes the engine start input from the recorder. The recorder power control circuit detects the removal of the engine start input. The recorder changes to the normal mode.

26. **NORMAL.** See WP006 00. Either the left or right generator operating or ground power application energizes no. 8 circuit breaker/relay panel assembly relay 1K-C111. Energized relay 1K-C111 sends a mission computer system on input to no. 7 circuit breaker/relay panel assembly relay 1K-C103. With GND PWR control panel assembly 1 switch in either A ON or B ON, relay 1K-C103 deenergizes and sends the mission computer system on ground to the recorder. The recorder power control circuit detects the mission computer system on input and energizes recorder relay A13K1. Energized relay A13K1 sends 28vdc to the recorder and converter power supplies. Activation of the recorder power supply causes the recorder cpu to scan the inputs. The recorder cpu detects the mission computer system on input. This puts the recorder cpu in the normal mode. When in the normal mode the recorder cpu does the below:

a. Produces MSDRS mux ready output to the mission computer system. This establishes communication between the mission computer system and recorder.

b. Communicates with converter, cartridge, and nose wheelwell DDI to do monitoring and recording functions. Sends data to mission computer system.

c. Responds to commands from mission computer system as below:

(1) If recorder receives maintenance code data from mission computer system, recorder produces indicator power on command which energizes recorder relay A13K2. Energized relay A13K2 sends 28vdc to nose wheelwell DDI power supply.

(2) If recorder receives record command from mission computer system, recorder produces cartridge power on command which energizes recorder relay A13K4 which sends power to the cartridge.

27. **Signal Data Converter CV-3493/ASM-612.** Receives analog and discrete inputs from non-avionic systems and converts them into 16 bit digital data words. Processed data is sent to the recorder as below:

a. Recorder sends transmit request output to converter.

b. Converter sends acknowledge reply to recorder.

c. Converter sends one data bit by way of the MSDRS mux for each clock pulse received from the recorder. After the converter sends 16 data bits to the recorder, it sends a final bit representing odd parity of the previous 16 data bits for transmission error detection.

d. The transmit request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the converter to the recorder.

28. **Signal Data Recorder RO-508/ASM-612.** Receives serial digital data from the converter by way of the MSDRS mux and discrete inputs from non-avionic systems. Discrete data is converted into 16 bit digital data words. The recorder puts all digital data in temporary storage until requested by the mission computer system.

29. When requested by the mission computer system, the recorder sends data by way of avionic mux channel 1 to digital data computer no. 1 (digital computer no. 1). Digital computer no. 1 compares the inputs to programmed parameters and uses them individually or combined with other inputs to compute:

a. maintenance codes.

b. caution/advisory messages.

c. engine monitoring data.

d. fatigue strain data.

30. **DATA PROCESSING.**

31. The MSDRS data processing operations are:

a. maintenance codes.

b. non-avionic caution and advisory messages.

c. inflight engine condition monitoring data.

d. fatigue strain data.

e. record function.

32. **MAINTENANCE CODES.** The mission computer system processes the data received and determines when a unit failure occurs. As failures occur, digital computer no. 1 sends applicable maintenance codes by way of avionic mux channel 1 to the recorder. The recorder puts the maintenance codes in memory.

NOTE

During nose wheelwell DDI fluids test function, the recorder processes fluid low inputs and computes applicable maintenance codes, independent of mission computer system. During APU start, if the mission computer system is not operating, the recorder processes APU inputs and computes applicable maintenance codes.

33. When a maintenance code is put in recorder memory the below occurs:

a. Recorder sends receive request output to nose wheelwell DDI.

b. Nose wheelwell DDI sends acknowledge reply to recorder.

c. Recorder sends one data word by way of MSDRS mux to nose wheelwell DDI for storage. Each data word contains maintenance code data and the type of maintenance code (unit fail, fluids low, or test code). During data acquisition this data causes nose wheelwell DDI to set the WPN SYS FAIL indicator (black and white). The WPN SYS FAIL indicator is black and white as a visual indication that there are failed unit maintenance codes stored in the nose wheelwell DDI.

34. If the data word is complete, the recorder removes the receive request output. This indicates data transfer is complete and the nose wheelwell DDI receives and stores the data. If the data word is not complete, the nose wheelwell DDI rejects the data and momentarily removes the acknowledge output. This indicates to the recorder that data received by the nose wheelwell DDI was abnormal. The recorder responds by removing the receive request output from the nose wheelwell DDI. The receive request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the recorder to the nose wheelwell DDI.

35. **Maintenance Code Inhibit - WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP.** See WP023 00. During digital computer no. 1 and no. 2 power initialization, digital computer no. 1 inhibits all maintenance codes except digital computer no. 1 and no. 2 codes 032, 034, 036, and 037 if the conditions below exist:

a. digital computer no. 1 has been operating less than 30 seconds.

b. digital computer no. 1 has been operating 30 seconds or more, but digital computer no. 2 has been operating less than 30 seconds.

36. **Nose Wheelwell DDI Memory Clear on Takeoff - WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP.** See WP023 00. After takeoff, when the aircraft indicated airspeed is greater than 80 knots for 20 seconds, digital computer no. 1 does the below:

a. Send reset memory output through signal data recorder to nose wheelwell DDI to clear maintenance codes from memory, except digital computer no. 1 and no. 2 memory alteration codes 034, and 037. Digital computer fail code 036 also is not cleared if digital computer no. 2 failed before memory clear.

b. Send reset signal output to radar, flight control electronic set, and high frequency communication systems to reset built-in test results.

37. **Non-Avionic Maintenance Codes.** See WP009 00 through WP012 00 and WP014 00 through WP022 00. The MSDRS sends non-avionic data to digital computer no. 1 over avionic mux channel 1. Digital computer no. 1 compares the non-avionic inputs to programmed parameters and uses them individually or combined with other inputs to compute non-avionic maintenance codes.

38. **Avionic Maintenance Codes.** The MSDRS does not monitor avionic systems data. Avionic systems, on avionic mux channel 1 or 2, send digital data directly to the mission computer system by way of the avionic mux channels. Avionic systems, not on avionic mux channel 1 or 2, send analog or discrete inputs to mission computer system control-converter. The control-converter changes the inputs to digital format and sends them by way of avionic mux channel 1 to digital computer no. 1. Digital computer no. 1 compares the inputs to programmed parameters and uses them individually or combined with other inputs to compute avionic maintenance codes.

39. **NON-AVIONIC CAUTION AND ADVISORY MESSAGES.** See WP011 00 and WP018 00 through WP022 00. The mission computer system processes the non-avionic data received from the MSDRS. If an advisory condition occurs, digital computer no. 1 sends the applicable advisory message by way of avionic mux channel 1 to the cockpit left DDI for display.

40. **Non-Avionic Cautions Without Voice Alert.** When digital computer no. 1 determines that a caution condition occurs, it does the below:

a. Sends the applicable caution message by way of avionic mux channel 1 to the cockpit left DDI for display.

b. Sends master caution set output by way of avionic mux channel 1 to the Control-Converter C-10382/A (control-converter). The control-converter changes the master caution set digital input to a discrete output. The control-converter sends the master caution set discrete to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

c. Sends ICS caution tone 1 (master caution) output by way of avionic mux channel 1 to the recorder. The recorder converts the master caution digital input to a discrete output. The recorder sends the master caution discrete output. The recorder sends the master caution discrete to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A which produces the master caution tone heard in the headset.

41. **Non-Avionic Cautions With Voice Alert.** Some non-avionic cautions have a voice alert related to them. When digital computer no. 1 determines that one of these caution conditions occurs, it does the below:

a. Sends the applicable caution message by way of avionic mux channel 1 to the cockpit left DDI for display.

b. Sends master caution set output by way of avionic mux channel 1 to the control-converter. The control-converter changes the master caution set digital input to a discrete output. The control-converter sends the master caution set discrete to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

c. Sends applicable voice alert message by way of avionic mux channel 1 to the control-converter. The control-converter changes the voice alert digital input to a discrete output. The control-converter sends the voice alert discrete to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A

which produces the applicable voice alert heard in the headset.

d. Inhibits the ICS caution tone 1 (master caution) output to the recorder. This prevents the master caution tone from being produced for voice alert cautions.

42. **INFLIGHT ENGINE CONDITION MONITORING DATA.** See WP009 00 and WP010 00. The mission computer system receives inflight engine condition monitoring data from the MSDRS. Digital computer no. 1 uses the engine data to compute maintenance codes and caution messages related to inflight engine condition monitoring operation. Digital computer no. 1 also processes the engine data and sends it by way of avionic mux channel 1 to the cockpit left DDI engine monitor display. Pressing the cockpit left DDI engine monitor display RECORD pushbutton switch causes the below:

a. Digital computer no. 1 commands recorder to record engine data on the cartridge for 35 seconds.

b. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 210, when RECORD pushbutton switch is pressed to start recording, a box appears around RECORD label. The box is removed when switch is released.

c. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP, when RECORD pushbutton switch is pressed to start recording, a box appears around RECORD label. The box is removed when engine data recording is completed.

43. **FATIGUE STRAIN DATA.** See WP012 00. The converter sends 10vdc excitation voltage to the seven fatigue strain gages. The strain gages sense the strain of the aircraft structure to which they are bonded. The strain gages produce an output proportional to the amount of strain sensed. The seven strain gages apply the strain outputs to the converter. The converter changes the seven analog strain inputs to digital outputs. The converter sends the digital strain data by way of the MSDRS mux to the recorder. The recorder sends the digital strain data by way of avionic mux channel 1 to digital computer no. 1.

44. Digital computer no. 1 samples the seven strain gage inputs from the recorder ten times each second. For each of the seven strain gage inputs, digital computer no. 1 does the below:

a. Compares last strain sample to present strain sample.

b. Computes peaks and valleys from incoming strain data

c. Tests for 10 percent reversal from previously stored peak or valley.

d. If a strain reversal of 10 percent or more is detected, places data below in strain message buffer word:

(1) existing strain data from seven strain

(2) fuel quantity total

(3) true airspeed

(4) process time

(5) aircraft altitude

(6) aircraft body roll rate

(7) aircraft normal acceleration

(8) process time

e. Commands recorder to record fatigue strain data message on cartridge tape.

NOTE

WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP, aircraft normal acceleration is monitored in place of left wing root strain.

45. Digital computer no. 1 monitors for excessive fatigue strain data recording. This can be caused by a defective strain gage or defective bonding of the strain gage to the aircraft structure. If digital computer no. 1 detects excessive fatigue strain recording from any of the seven locations, it does the below

a. Commands recorder to stop all fatigue strain data recording.

b. Sends maintenance code 926 (strain recording terminated) by way of avionic mux channel 1 to MSDRS nose wheelwell DDI for storage.

46. The defective strain gage is located and repaired or temporarily disabled to allow fatigue strain data recording to continue.

47. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+, to avoid filling the cartridge with fatigue strain data, digital computer no. 1 monitors the number of strain recordings during a five second period from any strain gage.

48. If the number of allowable strain recordings is exceeded, digital computer no. 1 stops strain recording from that strain gage and stores the applicable maintenance code. If the faulty strain gage does not exceed the strain count limit during the next five second period, strain data recording for that strain gage resumes, but the maintenance code remains.

49. If the total fatigue strain recordings from all strain gages exceed 1400 recordings, digital computer no. 1 stops all fatigue strain data recording. If a flight is longer than 80 minutes, digital computer no. 1 resumes fatigue strain data recording.

50. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 87X AND UP, to avoid filling the cartridge with fatigue strain data, digital computer no. 1 monitors the number of strain recordings during a 60 second period from any strain gage.

51. If the number of allowable strain recordings is exceeded, digital computer no. 1 stops strain recording from that strain gage and stores the applicable maintenance code.

52. If the total fatigue strain recordings from all strain gages exceed 1400 recordings, digital computer no. 1 stops all fatigue strain data recording. If a flight is longer than 80 minutes, digital computer no. 1 resumes fatigue strain data recording.

53. **RECORD FUNCTION.** See WP017 00. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 210, when the cartridge begins recording on the last half of the last track (track 4), maintenance code 812 (Magnetic Tape Cartridge MX-9972/ASM-612 full) is set.

54. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP, when the cartridge begins recording at the beginning of last track, maintenance code 812 is set.

55. The cartridge continues recording to the end of the last track. When the end of the last track is reached, all recording is stopped.

56. The signal data recorder receives commands to start recording from:

a. hardware

b. pilot

c. software

57. **Hardware Commanded Recording.** The recorder commands and controls recording independent of the mission computer system during engine start. The recorder commands the magnetic tape cartridge to record compressor speed and exhaust gas temperature of the engine being started for 60 seconds.

58. The mission computer system starts operation when the first engine started reaches idle speed. The recorder stays in the engine start mode for the remainder of the 60 second engine start period. The recorder changes to the normal mode at the end of the 60 seconds. Data from the second engine started is not recorded, but is monitored for abnormal conditions by the mission computer system.

59. **Pilot Commanded Recording.** The pilot commands recording of engine monitoring data by pressing the RECORD pushbutton switch on

the cockpit DDI engine monitor display. When the RECORD switch is pressed, a box appears around the RECORD label. WITH DIGITAL COMPUTER NO. 1 CONFIG/IDENT NUMBER 210, the box is removed when the RECORD switch is released. WITH DIGITAL COMPUTER NO. 1 CONFIG/IDENT NUMBER 86A+ AND UP, the box is removed when recording is completed.

60. The recorder controls cartridge drive electronics as commanded by the mission computer system. The recorder receives data to be recorded from digital computer no. 1 by way of avionic mux channel 1. The recorder temporarily stores data in memory buffers zero and one. When both memory buffers are full, digital computer no. 1 commands the recorder to transfer data to the cartridge. The aircraft and engine data listed under engine performance trending data is recorded for 36 seconds.

61. **Software Commanded Recording.** Digital computer no. 1 commands the recorder to record data at specific times determined by the operational flight program. The recorder controls cartridge drive electronics as commanded by the mission computer system. The recorder receives data to be recorded from digital computer no. 1 by way of avionic mux channel 1. The recorder temporarily stores data in memory buffers zero and one. When both memory buffers are full, digital computer no. 1 commands the recorder to transfer data to the cartridge. The types of software commanded recording are:

a. recorder initialization

b. fatigue initialization

c. engine performance trending

d. engine events

e. aircraft continuity

f. tactical

g. stores inventory

h. fatigue monitoring

i. flight incidents

j. engine life history

k. end of flight

62. Recorder Initialization. The recorder initialization message is recorded when the mission computer system determines the recorder is ready to begin operation. The recorder initialization message is made up of:

a. aircraft bureau number

b. aircraft flight number

c. date

d. recorder tape record counter

e. recorder track record counter

f. recorder response word

63. Fatigue Initialization. The fatigue initialization message is recorded after the engines are started. The fatigue initialization message is made up of:

a. aircraft normal acceleration

b. fuel quantity total

c. stores inventory message

64. Engine Performance Trending. The engine performance trending message is recorded when:

a. engines are run up for thrust test before launch.

b. an engine related caution or maintenance code condition occurs.

c. the pilot presses the RECORD pushbutton switch on the cockpit DDI engine monitor display.

65. The engine performance trending message is made up of:

a. left and right engine derichment

b. left and right exhaust gas temperature

c. left and right fan speed

d. left and right compressor speed

e. left and right engine nozzle position

f. left and right main fuel flow

g. left and right power lever angle

h. left and right engine percent takeoff thrust

i. left and right compressor discharge pressure

j. left and right turbine discharge pressure

k. left and right engine inlet temperature

l. best available aircraft altitude

m. mach number

n. total temperature

o. aircraft angle of attack

p. process time

q. left and right broadband vibration average

r. left and right fan speed 1/REV vibration average

s. left and right compressor speed 1/REV vibration average

t. left and right oil pressure average

u. left and right engine event flags 1 and 2

v. left and right fuel inlet temperature

w. aircraft normal acceleration

x. left and right engine compressor lockup

y. left and right engine bleed air door closed

z. approach power compensator engaged

aa. velocity control system engage/request

ab. left and right boost pressure low

ac. left and right anti-ice valve position (open)

ad. left and right engine sensor failures

66. Engine Events. The engine performance trending message is recorded when an engine related caution or maintenance code condition occurs. Five seconds of data occurring before the event and 35 seconds of data occurring after the event are recorded.

67. Aircraft Continuity. The aircraft continuity message is recorded when the aircraft takes off or lands, and every five minutes during flight. The aircraft continuity message is made up of:

a. process time

b. aircraft bureau number

c. inflight indication

d. flight number

e. date

f. flight record counter

g. recorder tape record counter

h. recorder track record counter

i. aircraft altitude

j. aircraft true airspeed

k. aircraft indicated airspeed

l. aircraft true angle of attack

m. aircraft normal acceleration

n. left and right compressor speed

o. left and right engine total stress rupture counts

p. recorder buffer 0 and 1 pointer

q. recorder buffer 0 and 1 starting address

r. recorder control commands

s. recorder mode

t. recorder responses

u. digital computer no. 1 internal data pertaining to data recording

68. Tactical Information. The tactical message is recorded when the aircraft is in air to air or air to ground aircraft master mode and weapon release switch is pressed to second detent. The air to air tactical message is made up of:

a. aircraft true airspeed

b. static pressure

c. true angle of attack

d. aircraft pitch attitude

e. aircraft outer roll attitude

f. aircraft altitude

g target relative altitude

h. target range

i. target range rate

j. allowable steering error (ABE) radius

k. target velocity (forward, right, down)

l. target acceleration (forward, right, down)

m. target line-of-sight direction (forward, right, down)

n. process time

o. recorder timer

69. The air to ground tactical message is made up of:

a. aircraft true airspeed

b. static pressure

c. true angle of attack

d. aircraft pitch attitude

e. aircraft outer roll attitude

f. aircraft altitude

g. allowable steering error

h. designated target coordinates valid

i. aircraft velocity (north/south, east/west, vertical)

j. computed wind (north/south, east/west, vertical)

k. target vector (north, east, down)

l. process time

m. recorder timer

70. Stores Inventory. The stores inventory message is recorded during fatigue initialization and each time a weapon is released. The stores inventory message is made up of:

a. stations 1 through 9 code and status

b. stations 1 through 9 weapon code and status

c. process time

d. recorder timer

71. Fatigue Monitoring. The fatigue monitoring message is recorded when digital computer no. 1 detects a fatigue strain reversal of 10 percent or more. The fatigue strain message is made up of:

a. left wing root strain

b. left wing fold strain

c. forward fuselage strain

d. left horizontal tail strain

e. right horizontal tail strain

f. left vertical tail strain

g. right vertical tail strain

h. process time

i. fuel quantity total

j. aircraft true airspeed

k. aircraft altitude

l. aircraft body roll rate

m. aircraft normal acceleration

72. Flight Incidents. The flight incident message is recorded once every five seconds and whenever there is a change in the state of a caution, advisory, or electronic flight control system discrete. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85+ AND UP (A1-F18AC-SCM-000), if spin mode is engaged the flight incident message is recorded once every half second. The flight incident message is made up of:

a. roll, pitch, and yaw rate

b. aircraft normal acceleration

c. aircraft lateral acceleration

d. true angle of attack

e. indicated airspeed

f. weight on wheels

g. barometric corrected pressure attitude

h. radar altitude

i. longitudinal stick force

j. lateral stick force

k. rudder pedal force

l. left and right power lever angle

m. process time

n. recorder timer

o. pitch

p. outer roll

q. magnetic heading

r. pressure altitude

s. left and right exhaust gas temperature

t. left and right compressor speed

u. left and right fan speed

v. left and right main fuel flow

w. fuel quantity total

x. left and right stabilator position

y. left and right trailing edge flap position

z. left and right outboard leading edge flap position

aa. left and right rudder position

ab. left and right aileron position

ac. left and right AMAD oil pressure low

ad. caution words

ae. advisory status word

af. spin recovery

ag. spin

ah. takeoff trim set

ai. heading hold engaged

aj. attitude hold engaged

ak. barometric altitude hold engaged

al. radar altitude hold engaged

am. stick left or right for spin recovery

an. auto spin selected

73. Engine Life History. The engine life history message is recorded when the engines return to idle speed after landing. The engine life history message is made up of:

a. aircraft bureau number

b. flight number

c. left and right life cycle full fatigue counter

d. left and right life cycle partial fatigue counter

e. left and right full thermal counter

f. left and right time at maximum power

g. left and right compressor discharge pressure cycle A counter

h. left and right compressor discharge pressure cycle B counter

i. left and right total stress rupture counts

j. left and right engine total time

k. process time

74. End of Flight. The end of flight message is recorded as part of power down sequence before power is removed from digital computer no. 1 and recorder. The end of flight message is made up of:

a. recorder control commands

b. aircraft bureau number

c. recorder flight record counter

d. recorder tape record counter

e. recorder track record counter

f. flight number

g. date

h. process time

i. recorder timer

75. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP, additional software commanded recording is provided:

a. aircraft/avionics configuration

b. avionic built-in test

c. avionic multiplex bus communication loss

d. nose wheelwell DDI maintenance code history

76. Aircraft/Avionics Configuration. The aircraft/avionics configuration message is recorded each time the aircraft takes off or lands. The configuration message is made up of:

a process time

b. aircraft lot identification

c. aircraft bureau number

d. flight number

e. date

f. avionic systems operational flight programs

g. avionic systems configuration words

77. Avionic Built-In Test. Built-in test (BIT) data for avionic systems with mux channel reported BIT results is recorded. The system function status word, function fail word, and weapon replaceable assembly (WRA) fail words are recorded any time there is a change in their status. The avionic BIT status message is made up of:

a. true airspeed

b. static pressure

c. true angle of attack

d. aircraft pitch attitude

e. aircraft roll attitude

f. aircraft normal acceleration

g. best available aircraft altitude

h. avionic systems function status, function fails, and weapon replaceable assembly fails

78. Avionic Multiplex Bus Communication Loss. Avionic multiplex bus communication data is recorded when digital computer no. 1 detects loss of communication with avionic systems. Avionic multiplex bus communication data is made up of:

a. aircraft bureau number

b. flight number

c. inflight indication

d. number of total terminal failures for each unit

e. number of total terminal failures for all units

NOTE

Digital computer no. 1 computes separate totals for total terminal failures occurring inflight and on the ground.

79. Nose Wheelwell DDI Maintenance Code History. When power is on the aircraft all maintenance codes are recorded when a new maintenance code condition occurs. The maintenance code history message is made up of:

a. nose wheelwell DDI message table

b. aircraft altitude

c. mach number

d. total temperature

e. aircraft angle of attack

80. WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 87X AND UP, additional software commanded recording is provided:

a. fatigue landing data

b. hard landing data

c. angle of attack/dynamic pressure data

81. Fatigue Landing Data. The fatigue landing message is recorded after weight off wheels for two seconds followed by weight on wheels for 0.6 second. The fatigue landing message is made up of:

a. for latest landing and for hardest landing this flight

(1) maximum normal acceleration

(2) aircraft weight

(3) maximum vertical velocity

(4) which landing gear touched down first

b. product of normal acceleration times aircraft weight (used to determine if hard landing occurred).

82. Hard Landing Data. When digital computer no. 1 determines a hard landing has occurred pre-event and post-event landing data is recorded. The hard landing message is made up of:

a. pre-event and post-event data

(1) aircraft normal acceleration

(2) vertical velocity

(3) weight on wheels for all landing gear

(4) longitudinal acceleration

(5) aircraft pitch

(6) aircraft roll

(7) left and right engine power lever angle

b. post-event data also includes:

(1) hard landing data code limit in pounds

(2) hard landing inspect code limit in pounds

83. Angle of Attack/Dynamic Pressure Data. The angle of attack/dynamic pressure message is a record of time spent at various angles of attack

and dynamic pressure readings. The data is updated after take-off when indicated airspeed is greater than 80 knots. The data is recorded after landing when both engine power lever angles are less than 29° or when any element exceeds the maximum value.

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - POWER

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

None

Alphabetical Index

Subject **Page No.**

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 90	-	GFE Battery Relay Control Unit; Incorporation of (ECP MDA-F/A-18-00165R1)	1 Aug 88	ECP Coverage Only
F/A-18 AFC 253	-	U.S. Naval Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

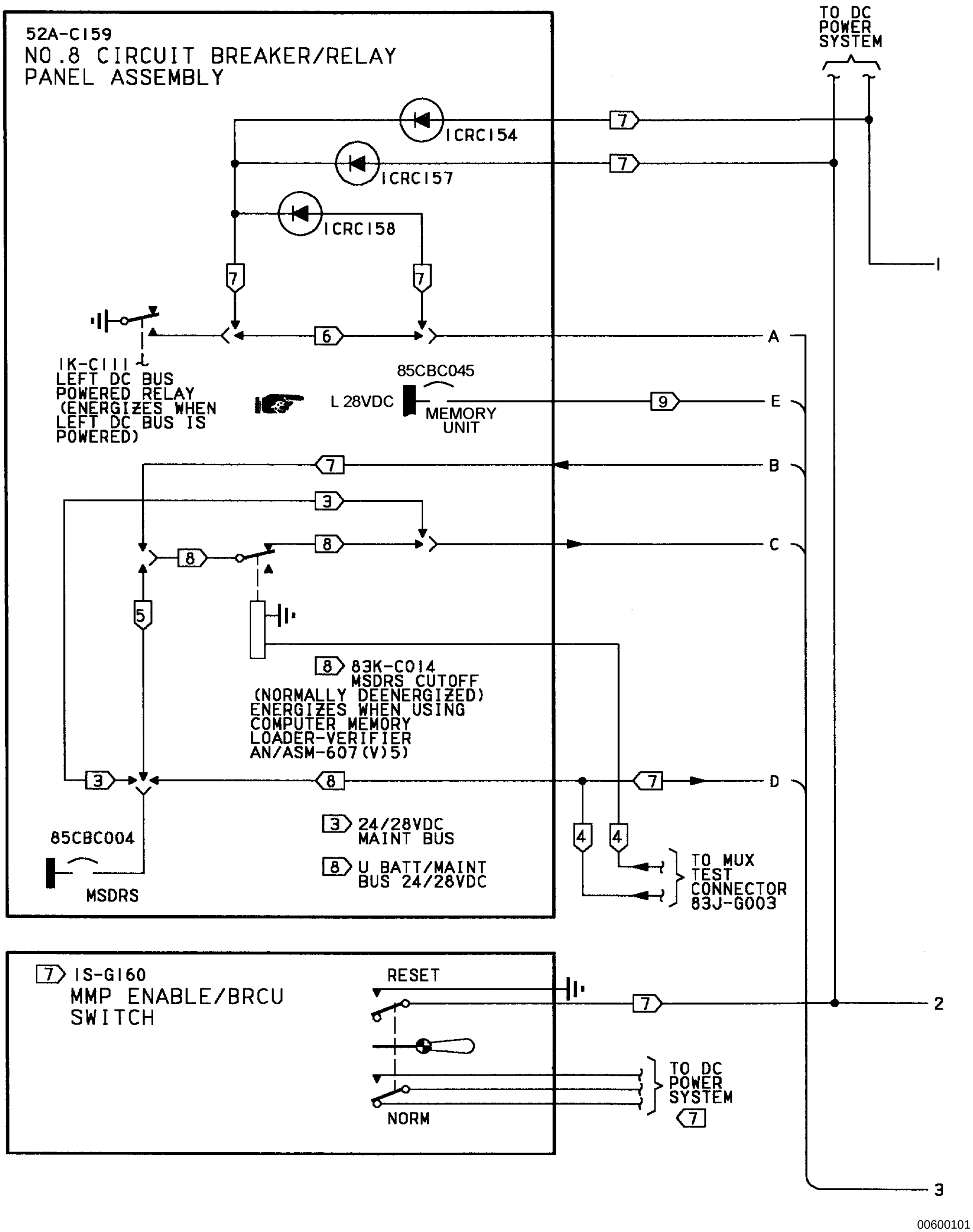
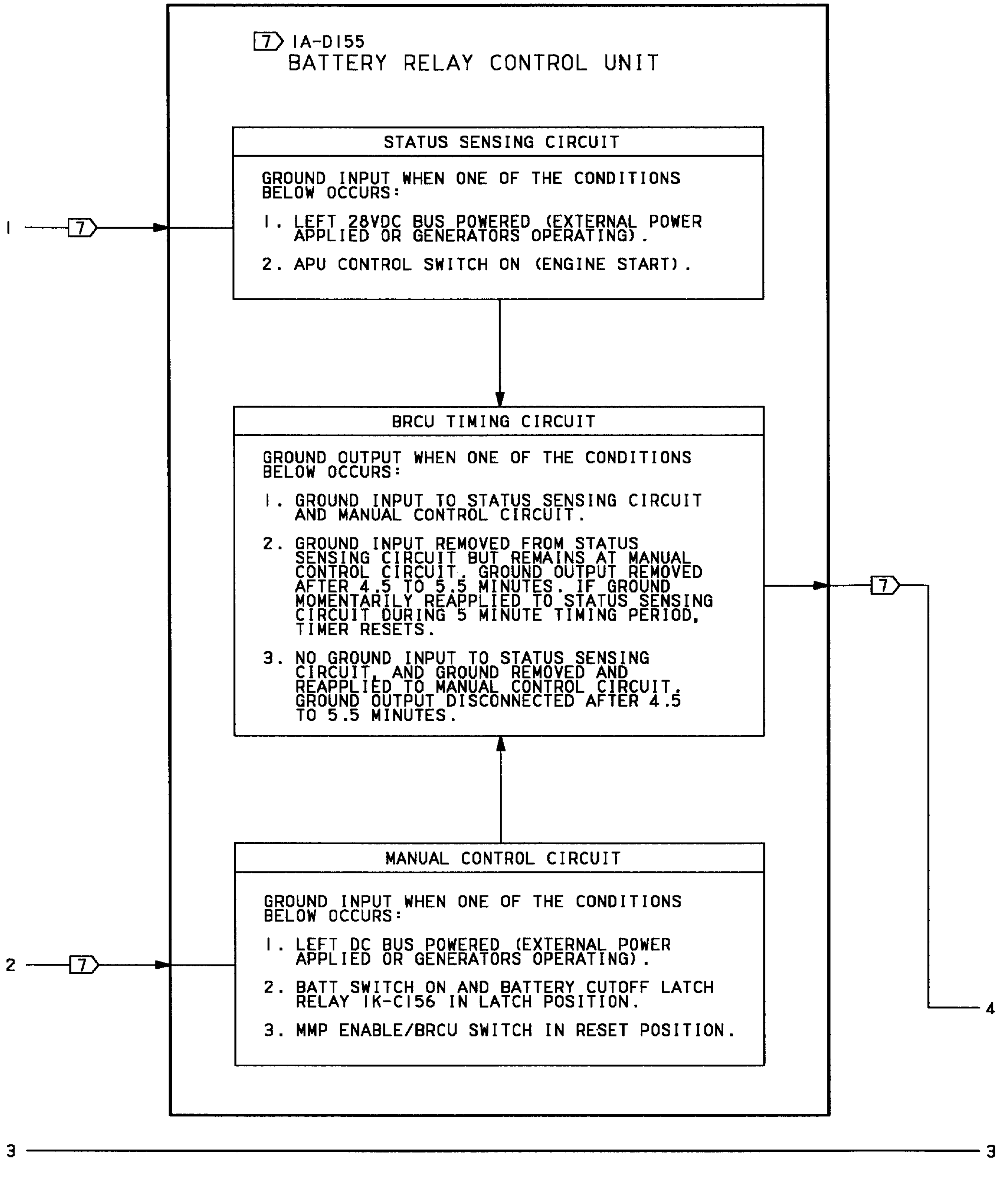


Figure 1. Simplified Power Schematic (Sheet 1)



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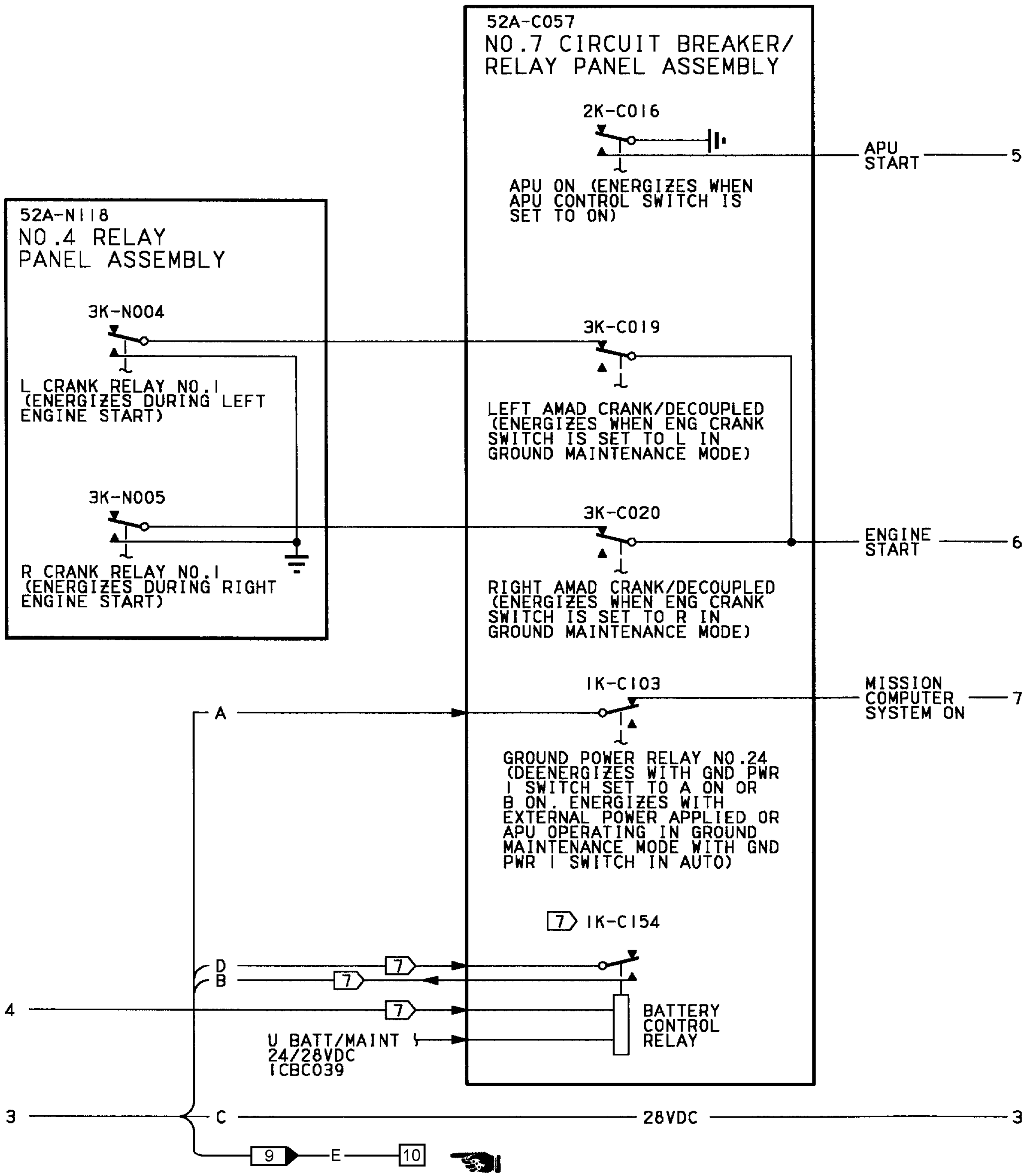
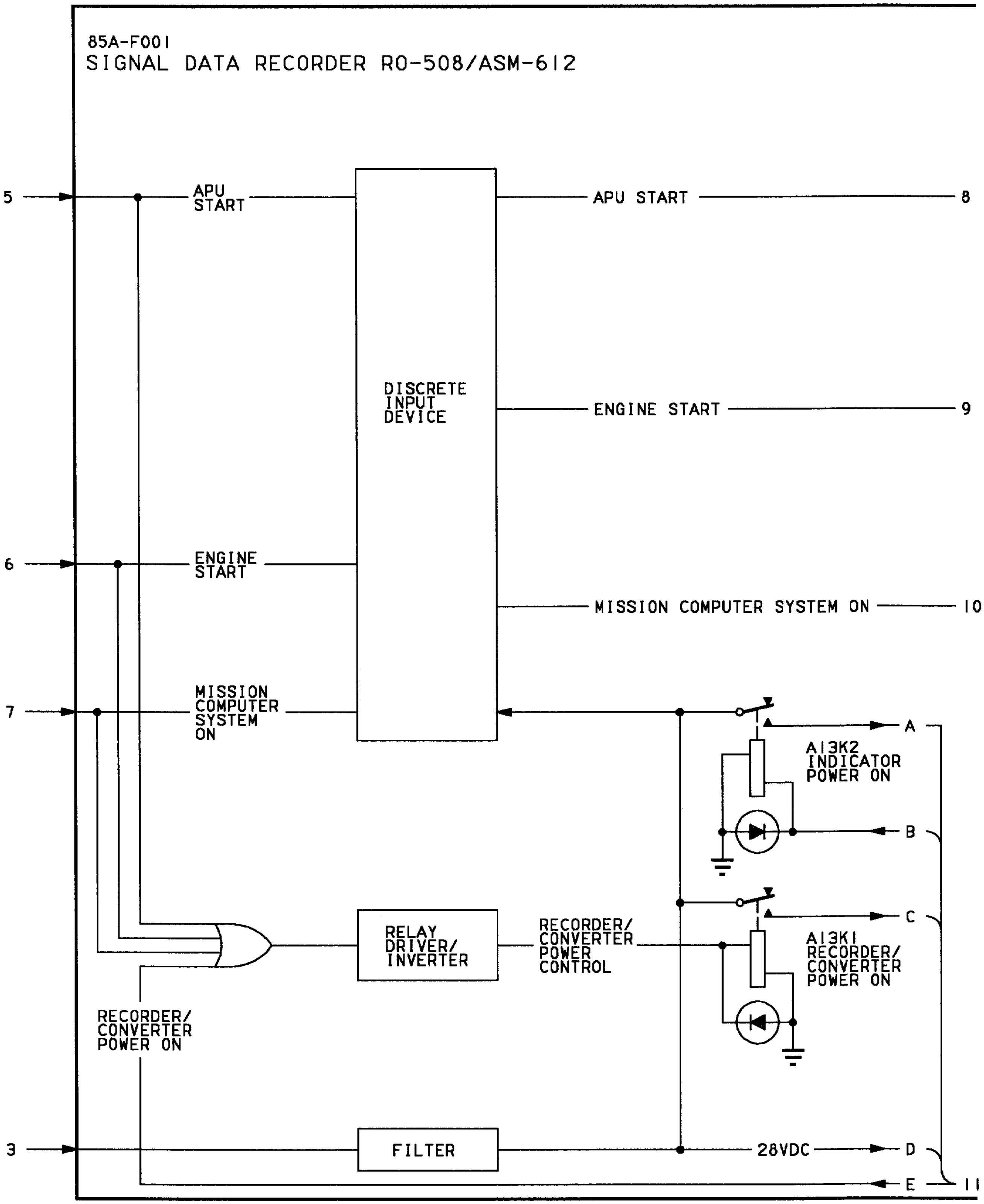


00600103

Figure 1. Simplified Power Schematic (Sheet 3)



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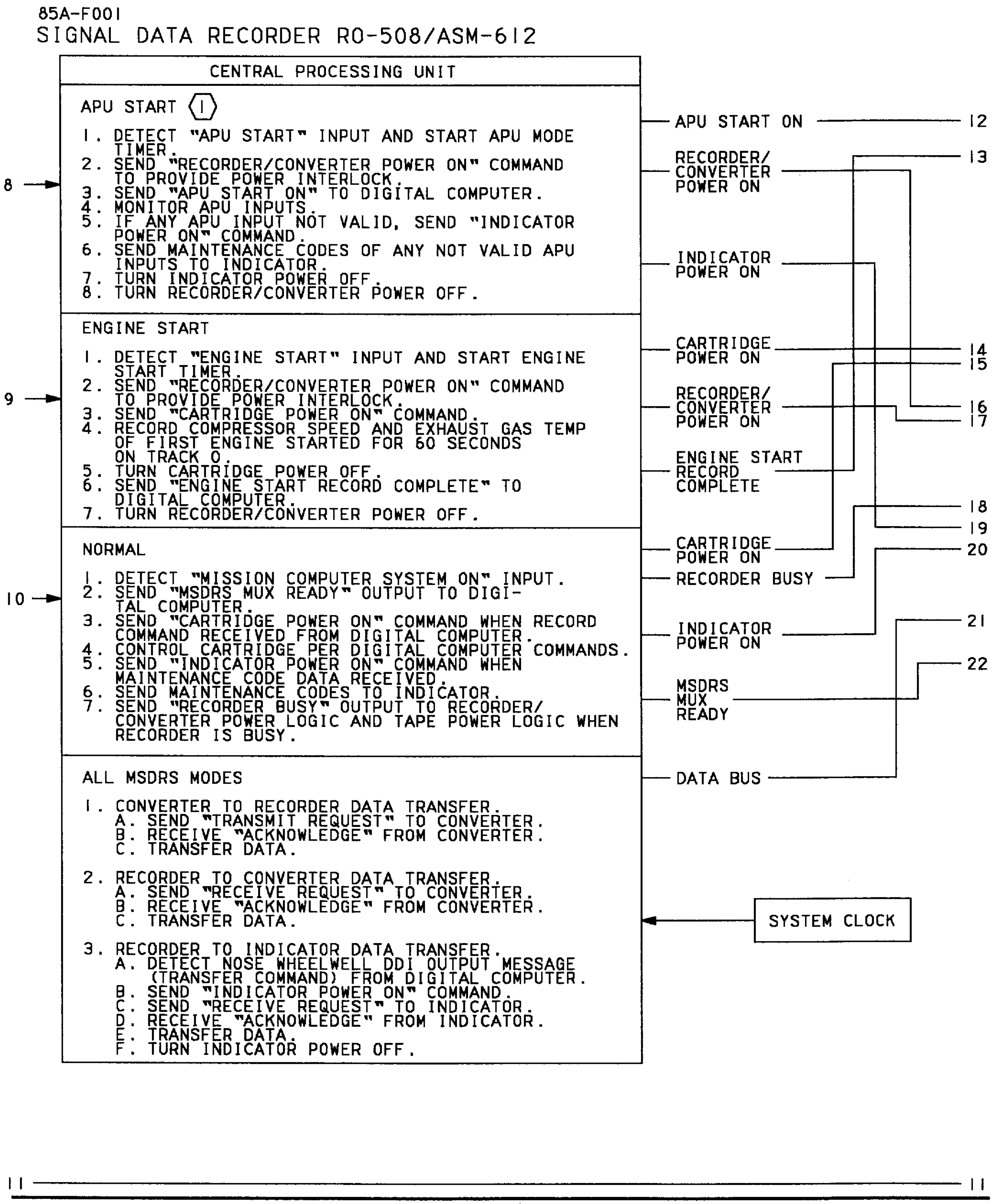

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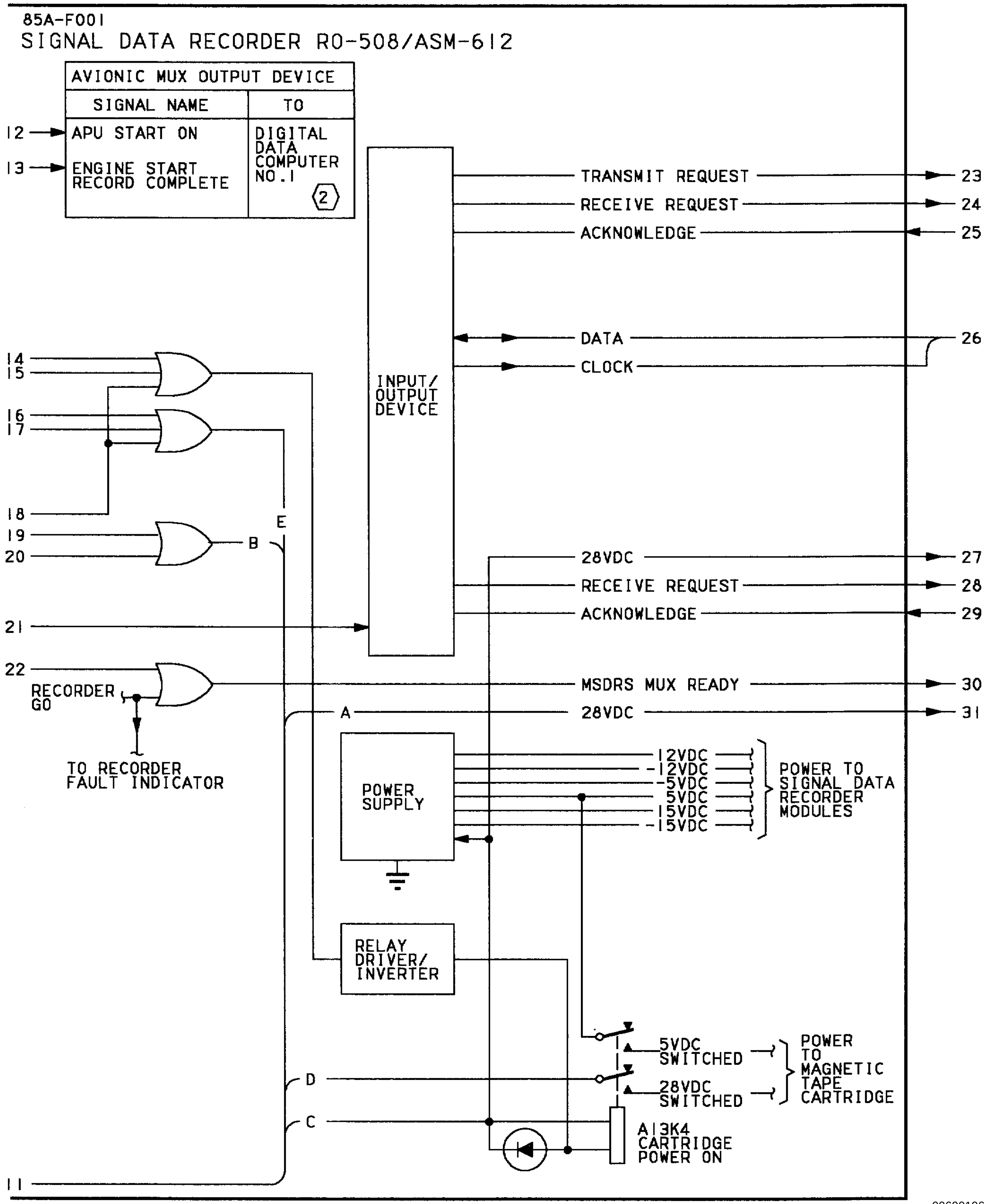
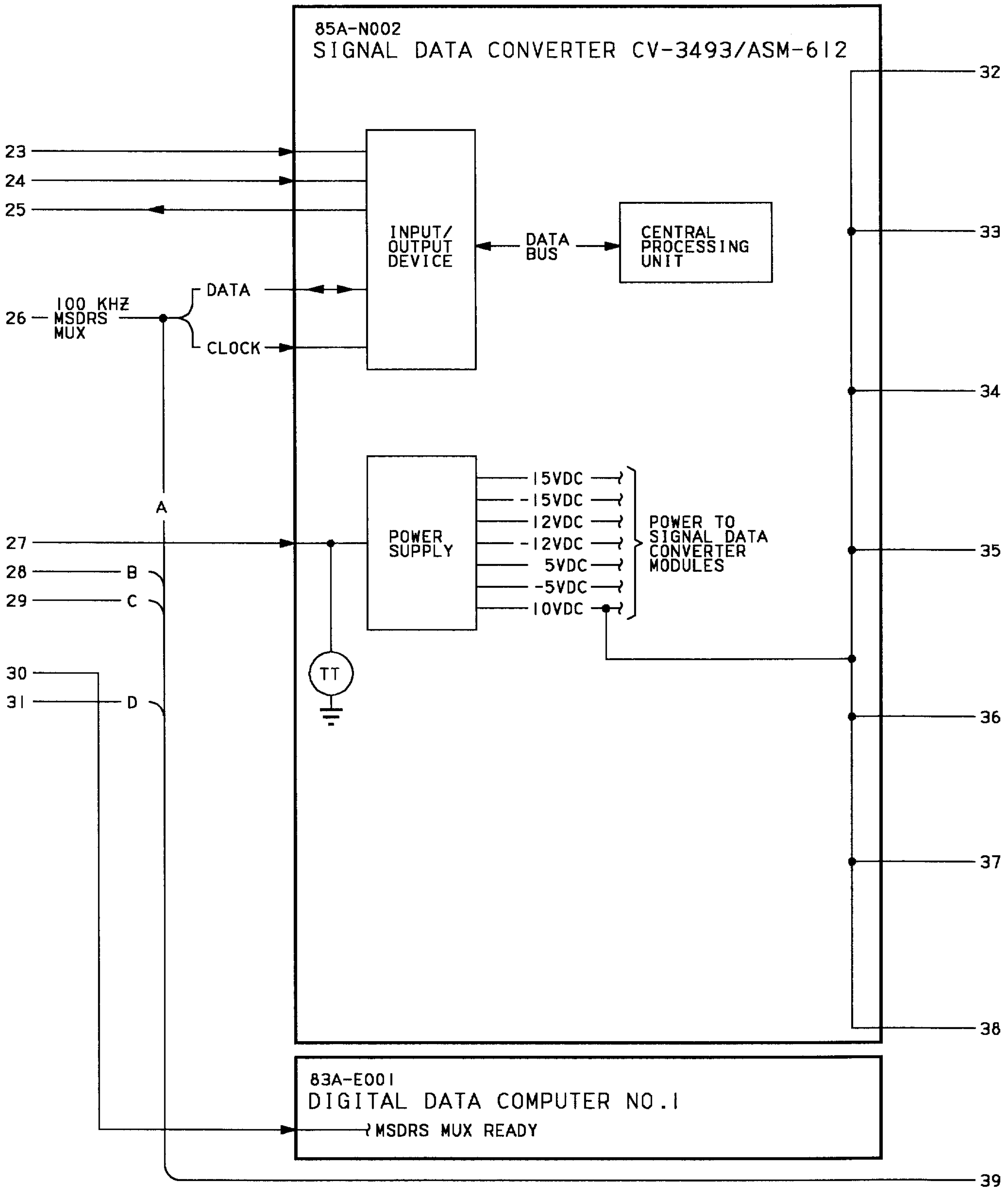


00600106

Figure 1. Simplified Power Schematic (Sheet 6)



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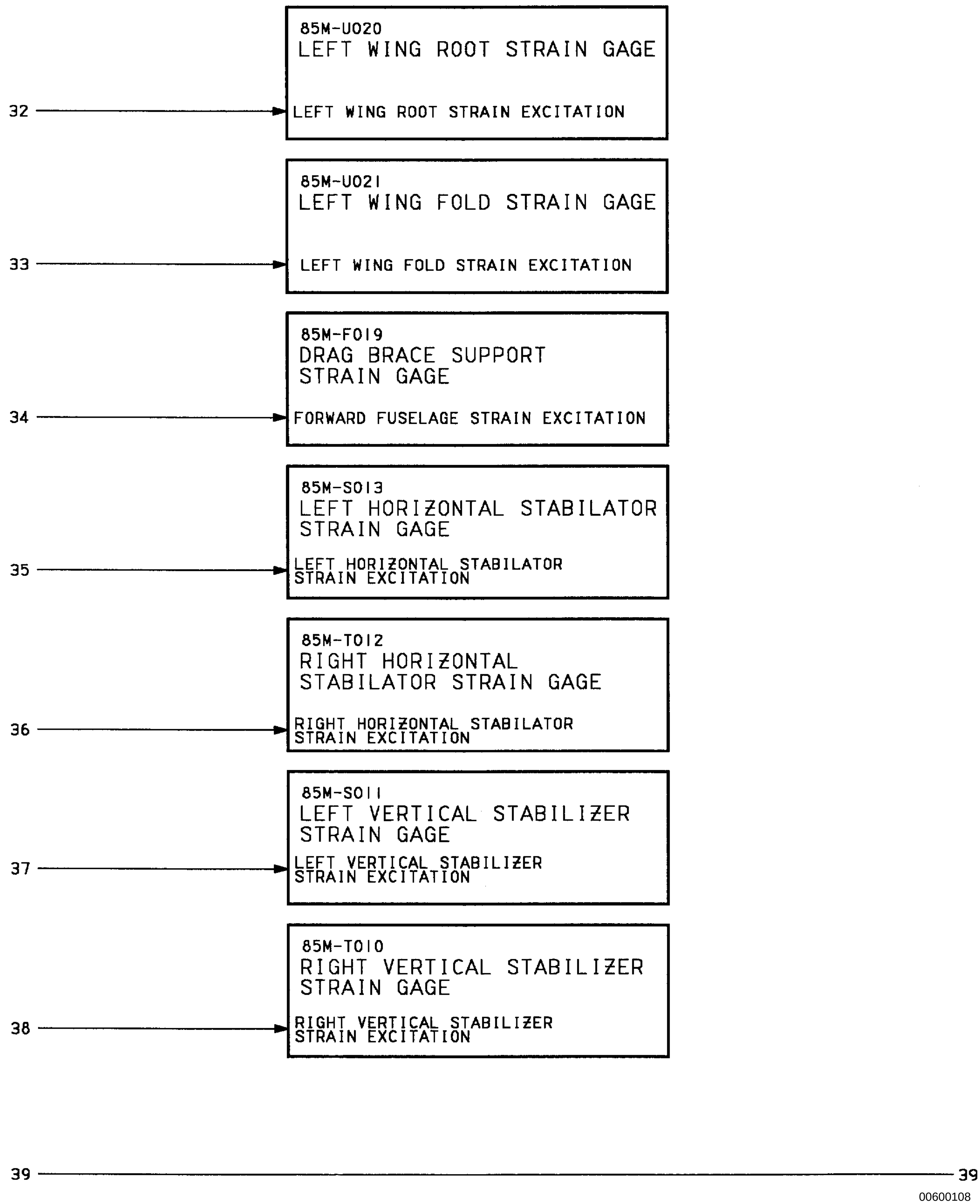

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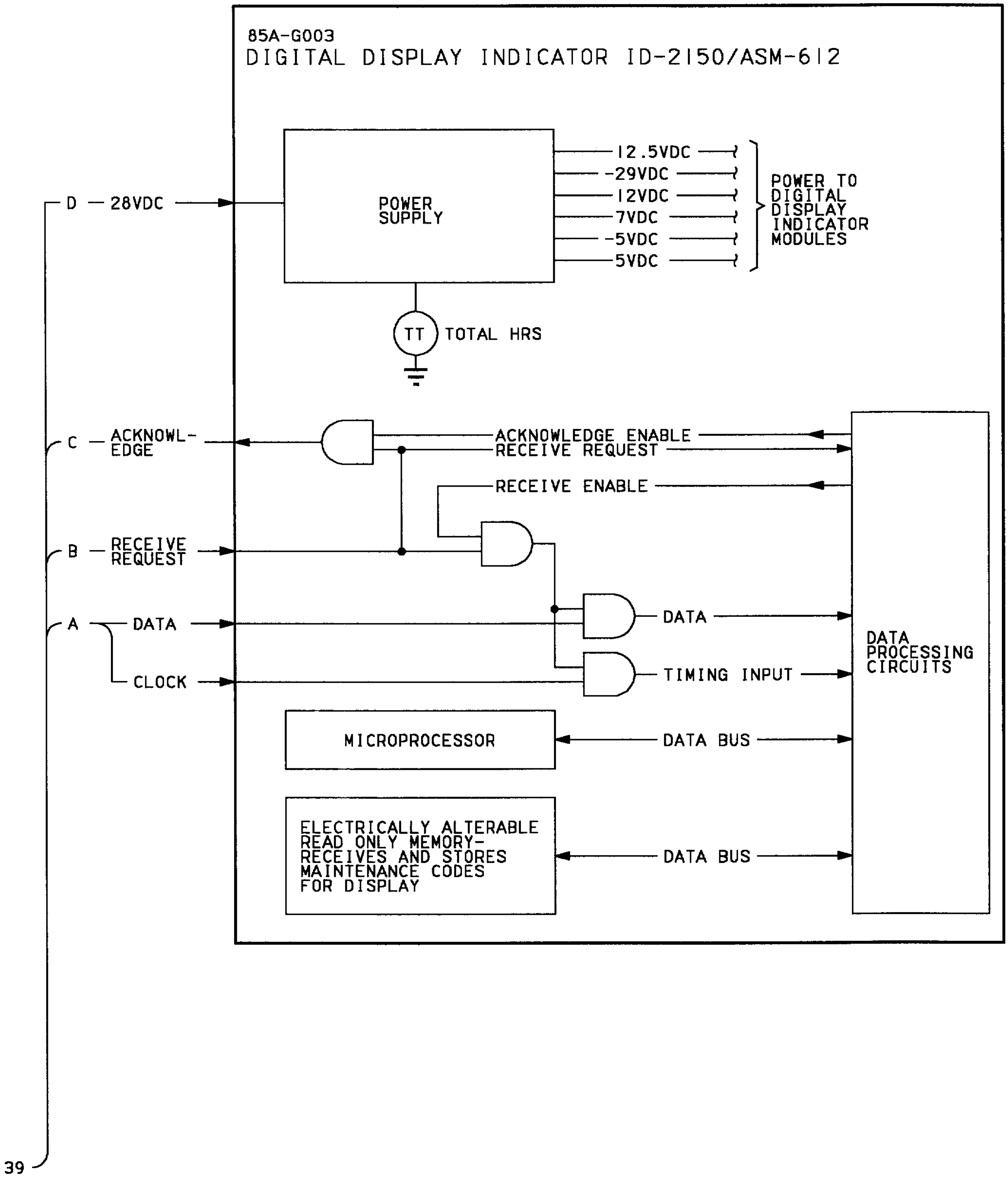
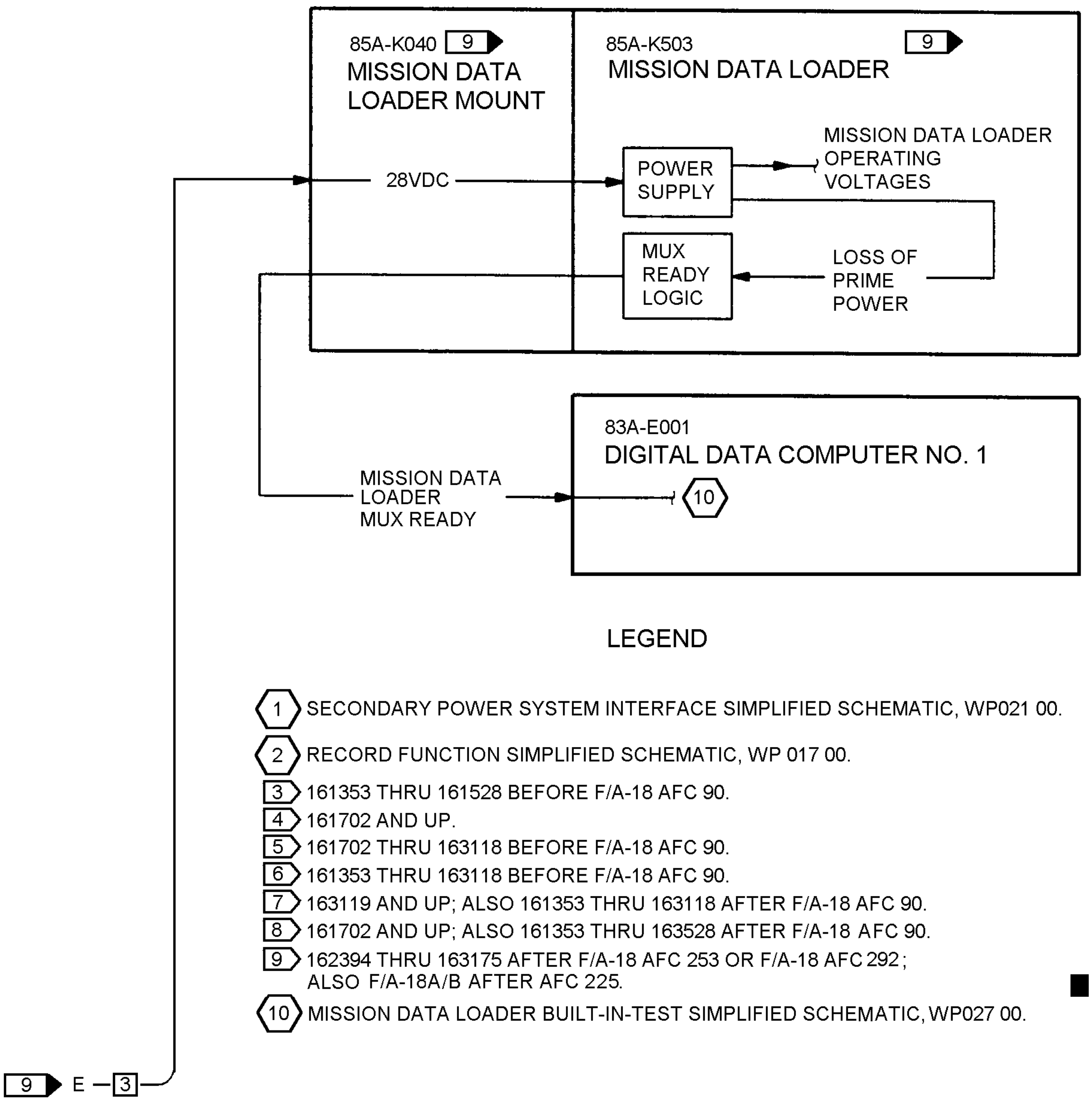


00600109

Figure 1. Simplified Power Schematic (Sheet 9)



00600110

Figure 1. Simplified Power Schematic (Sheet 10)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC – LEFT ENGINE INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP009 00, dated 15 May 1985.

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

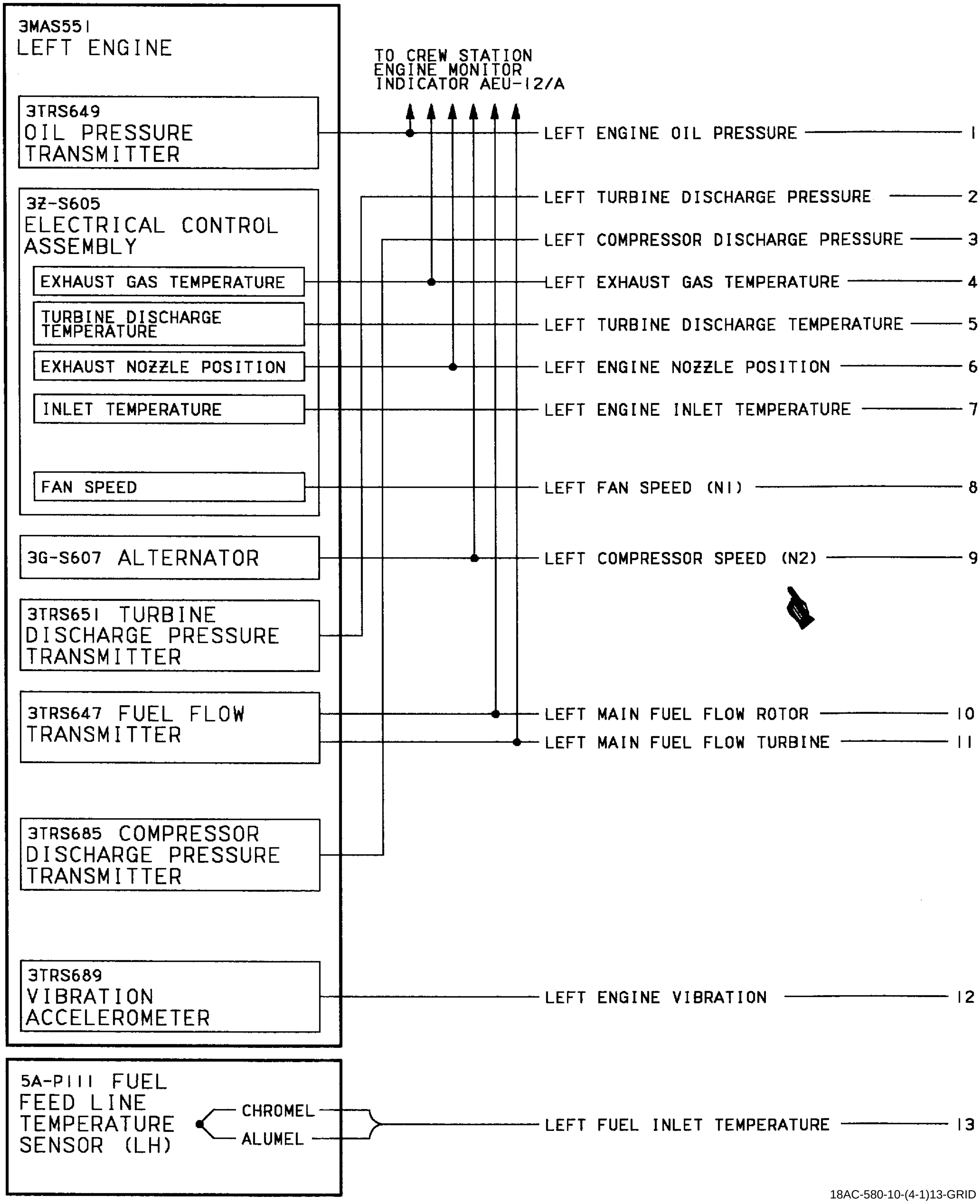
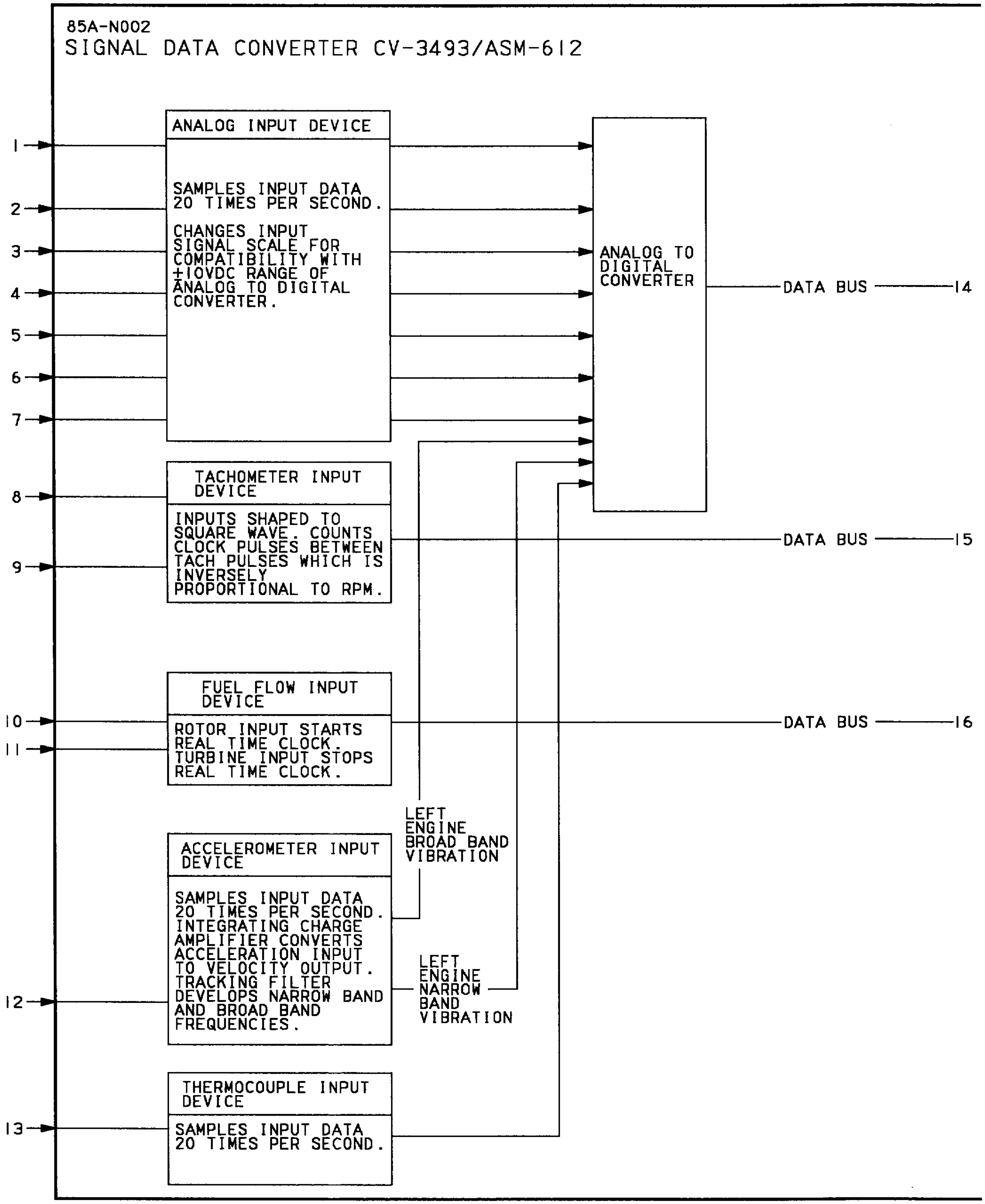
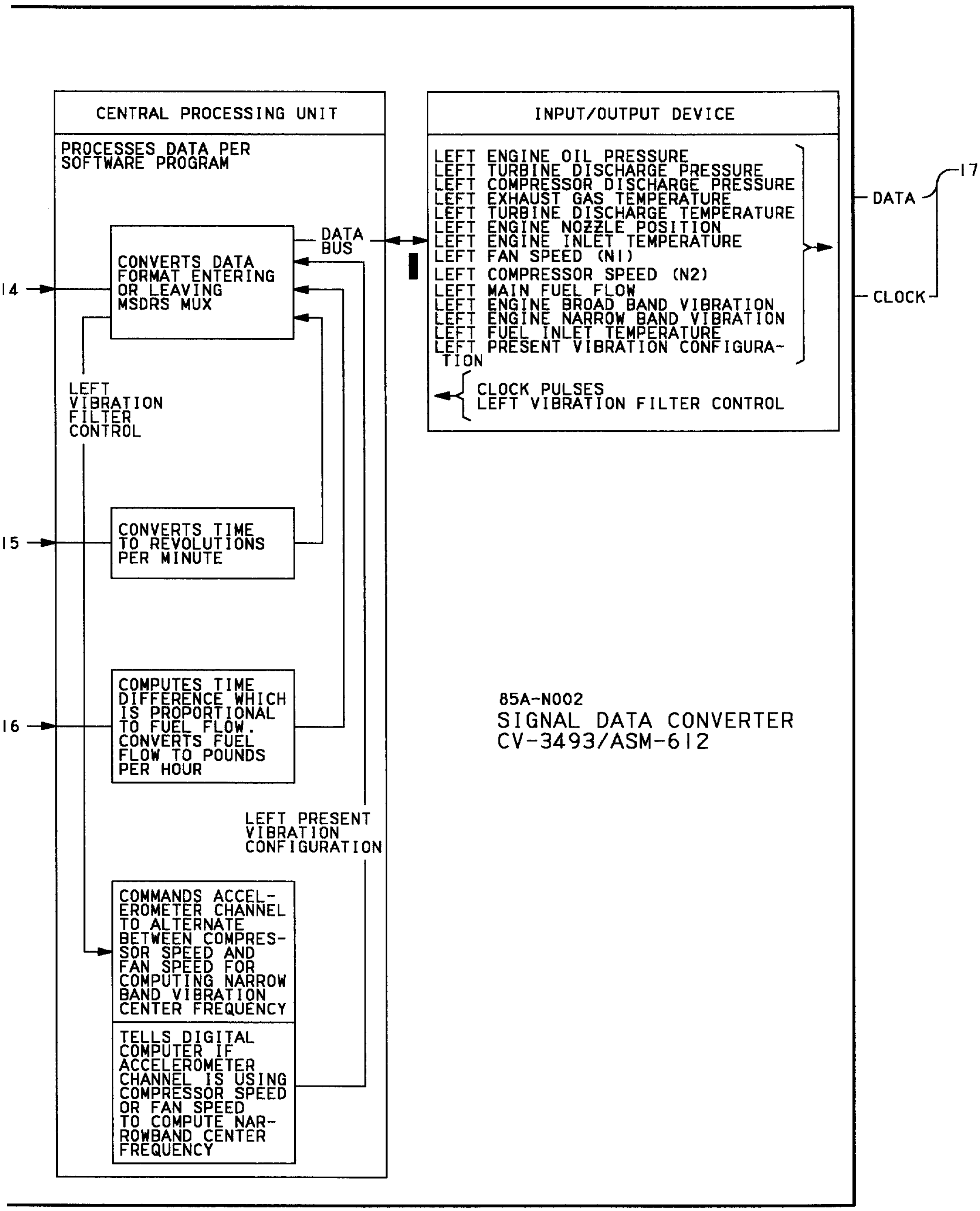


Figure 1. Left Engine Simplified Schematic (Sheet 1)



18AC-580-10-(4-2)A-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 2)



18AC-580-10-(4-3)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 3)

17 —— 100 KHZ MSDRS MUX —— 17

85A-G003
DIGITAL DISPLAY INDICATOR ID-2150/ASM-612

ELECTRICALLY ALTERABLE READ ONLY MEMORY-RECEIVES AND STORES MAINTENANCE CODES FOR DISPLAY

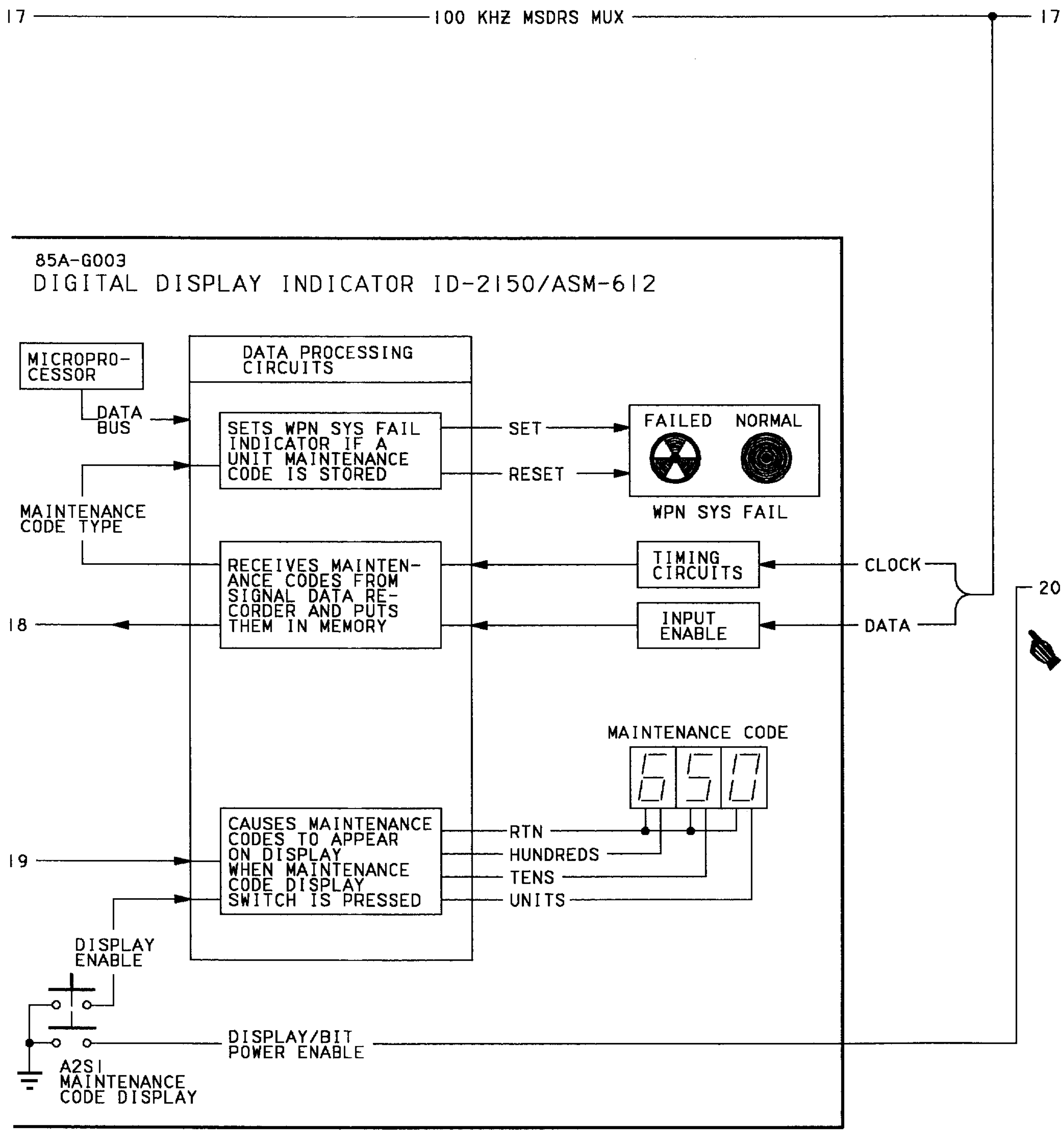
MAINT CODE	MAINTENANCE CODE MESSAGE
650	LEFT ENGINE FAN SPEED (N1) SIGNAL FAIL
651	LEFT ENGINE COMPRESSOR SPEED (N2) SIGNAL FAIL
652	LEFT ENGINE EGT SIGNAL FAIL
658	LEFT FUEL TEMPERATURE SIGNAL FAIL
659	LEFT ENGINE COMPRESSOR DISCHARGE PRESSURE SIGNAL FAIL
660	LEFT ENGINE TURBINE DISCHARGE PRESSURE SIGNAL FAIL
661	LEFT ENGINE INLET TEMPERATURE SIGNAL FAIL
662	LEFT ENGINE OIL PRESSURE SIGNAL FAIL
702	LEFT ENGINE LEVEL 3 EGT OVERTEMP
703	LEFT ENGINE FAN VIBRATION HIGH
704	LEFT ENGINE COMPRESSOR VIBRATION HIGH
706	LEFT ENGINE OIL PRESSURE HIGH
707	LEFT ENGINE OIL PRESSURE LOW
709	LEFT ENGINE LEVEL 2 EGT OVERTEMP
710	LEFT ENGINE LEVEL 3 FAN OVERSPEED
711	LEFT ENGINE LEVEL 2 FAN OVERSPEED
712	LEFT ENGINE LEVEL 1 FAN OVERSPEED
713	LEFT ENGINE LEVEL 3 COMPRESSOR OVERSPEED
714	LEFT ENGINE LEVEL 2 COMPRESSOR OVERSPEED
715	LEFT ENGINE LEVEL 1 COMPRESSOR OVERSPEED
716	LEFT ENGINE FLAMEOUT 6

MAINTENANCE CODES —— 18

MAINTENANCE CODES —— 19

18AC-580-10-(4-4)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 4)



18AC-580-10-(4-5)D-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 5)

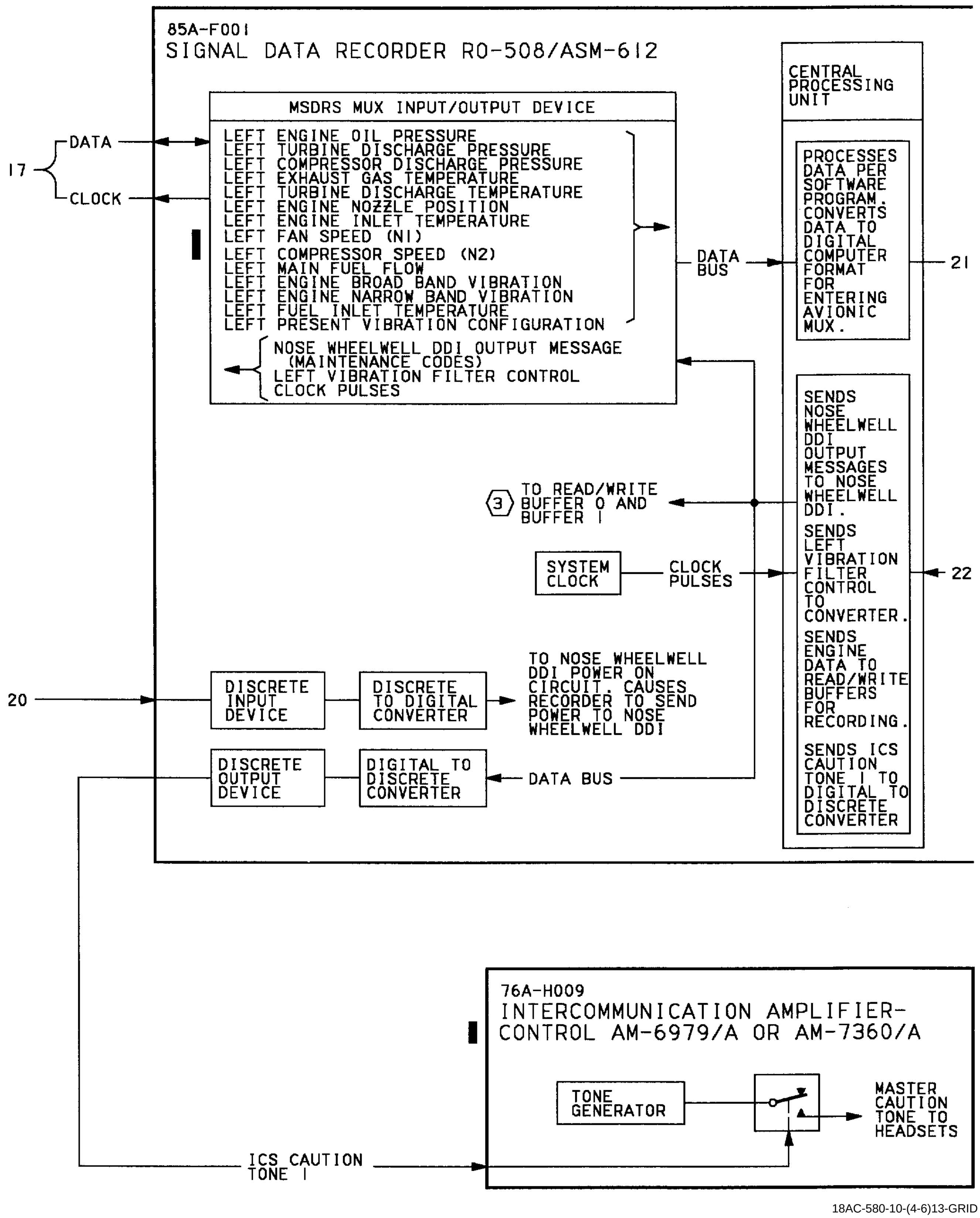
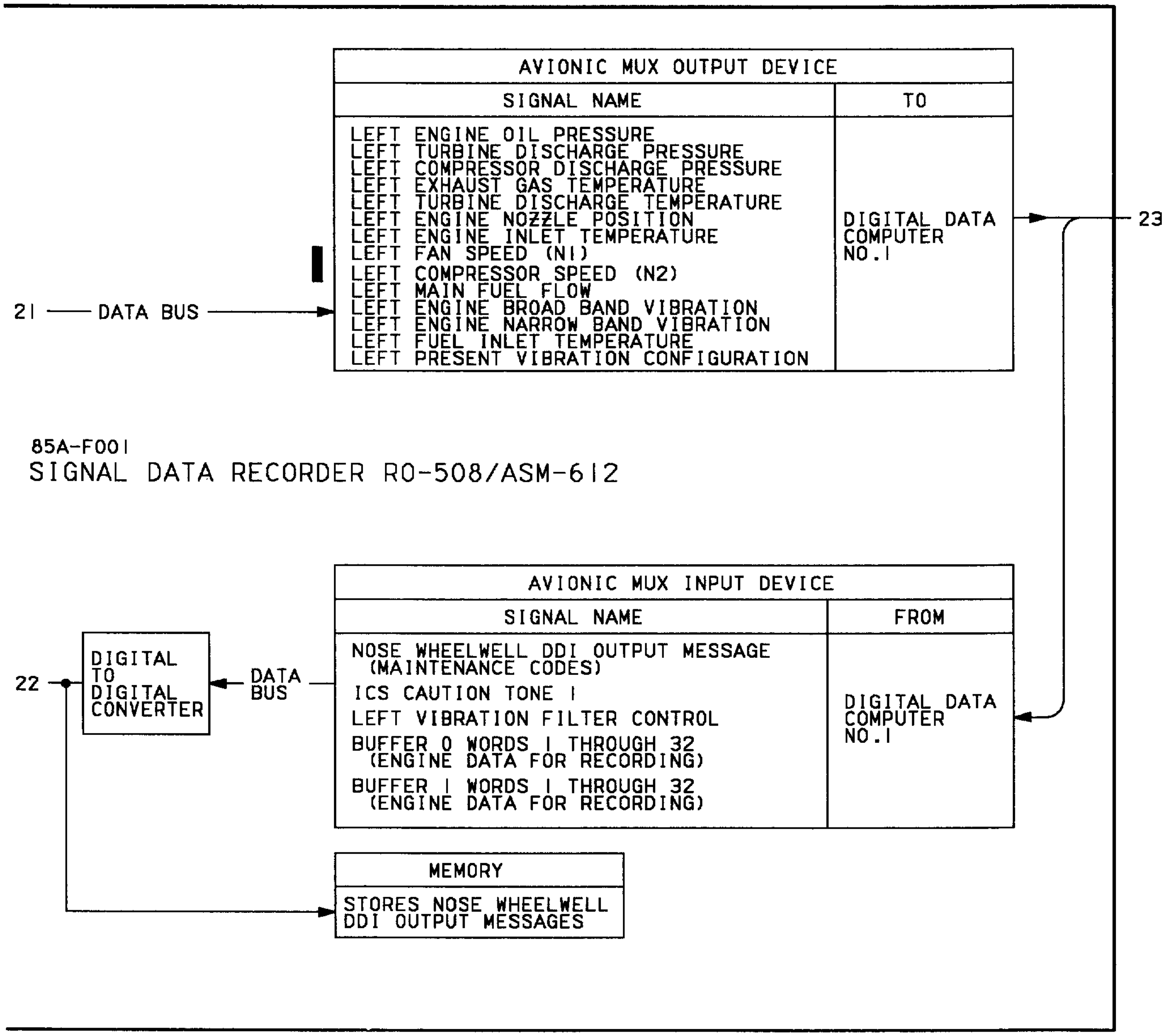
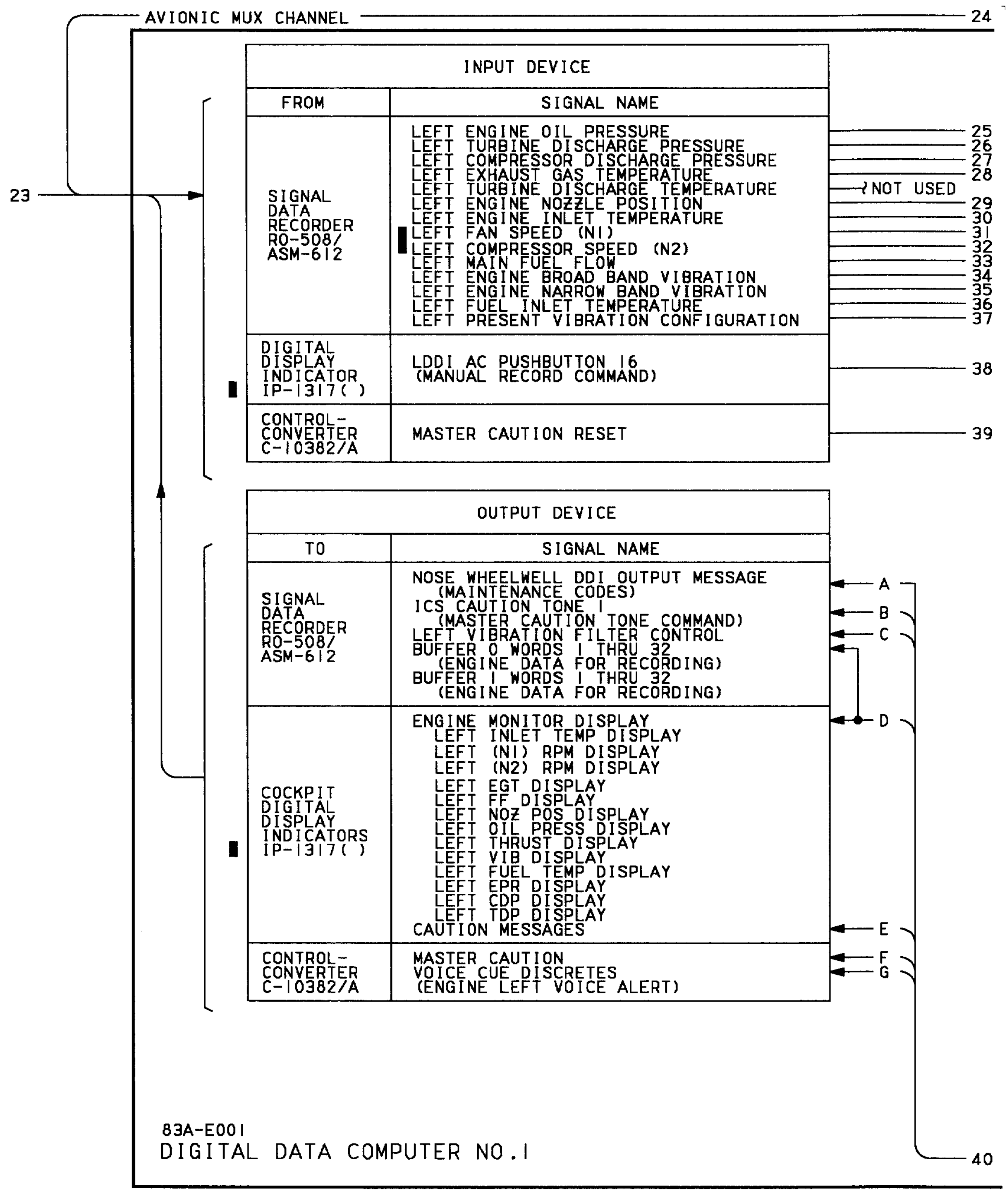


Figure 1. Left Engine Simplified Schematic (Sheet 6)



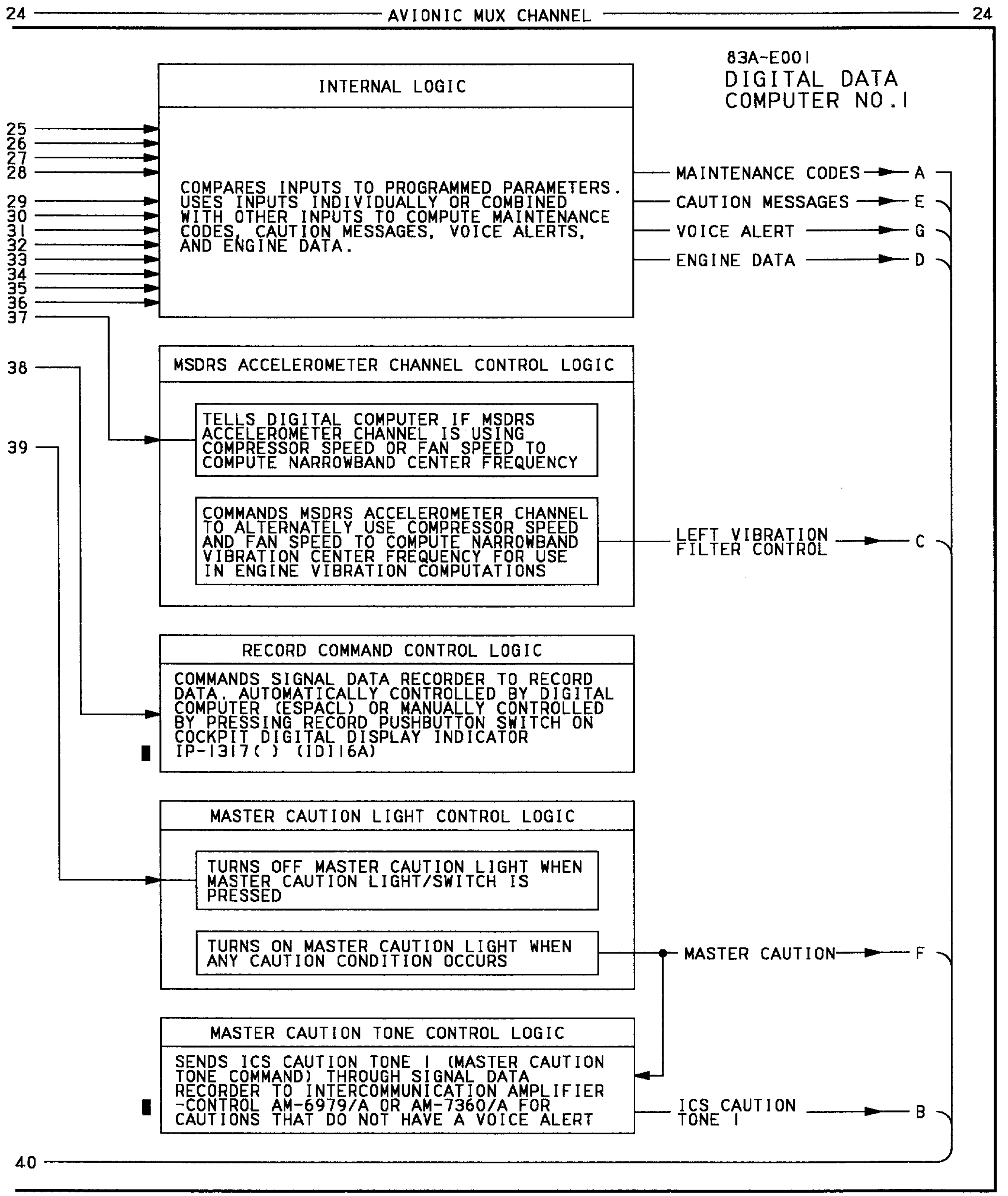
18AC-580-10-(4-7)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 7)



18AC-580-10-(4-8)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 8)



18AC-580-10-(4-9)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 9)

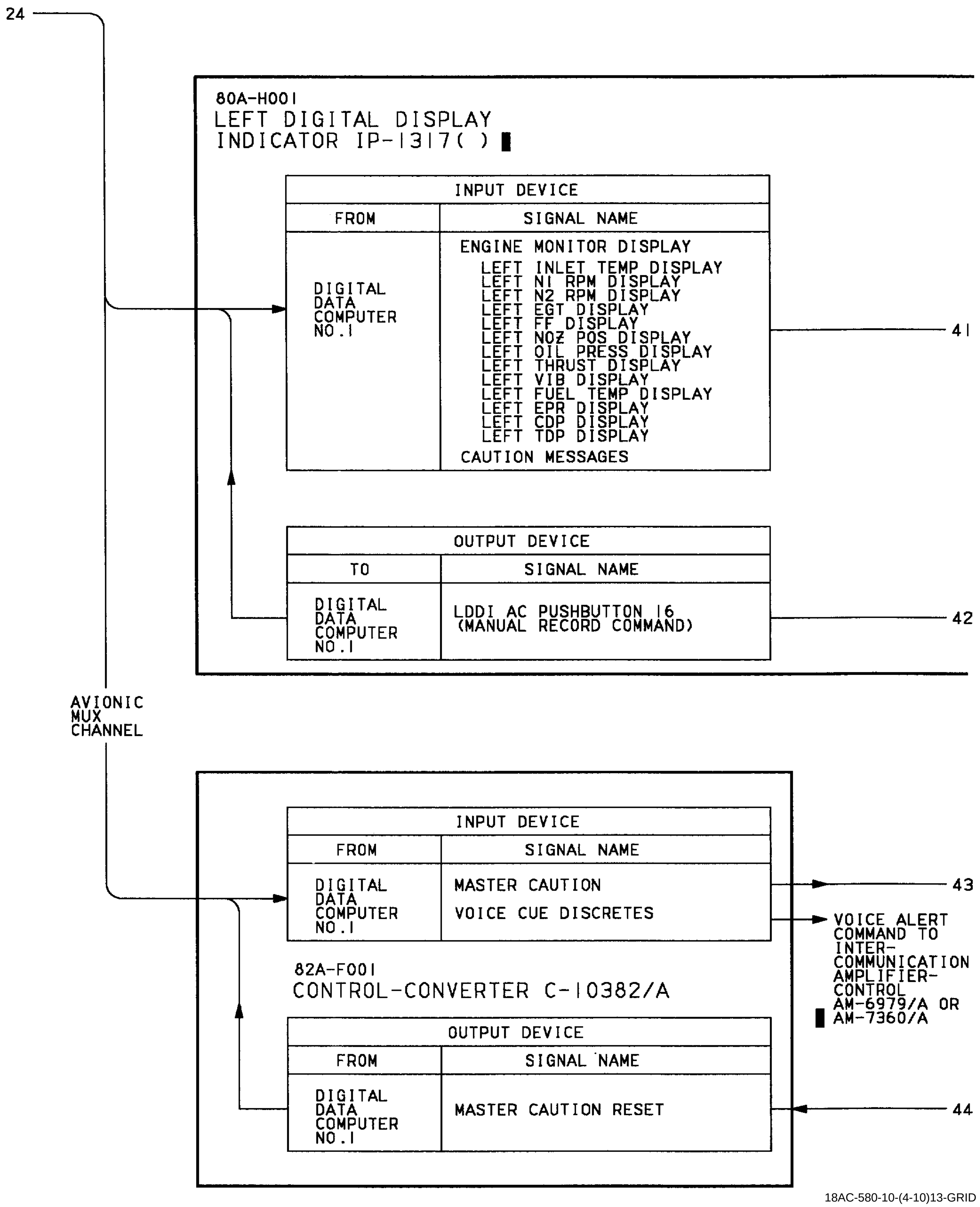
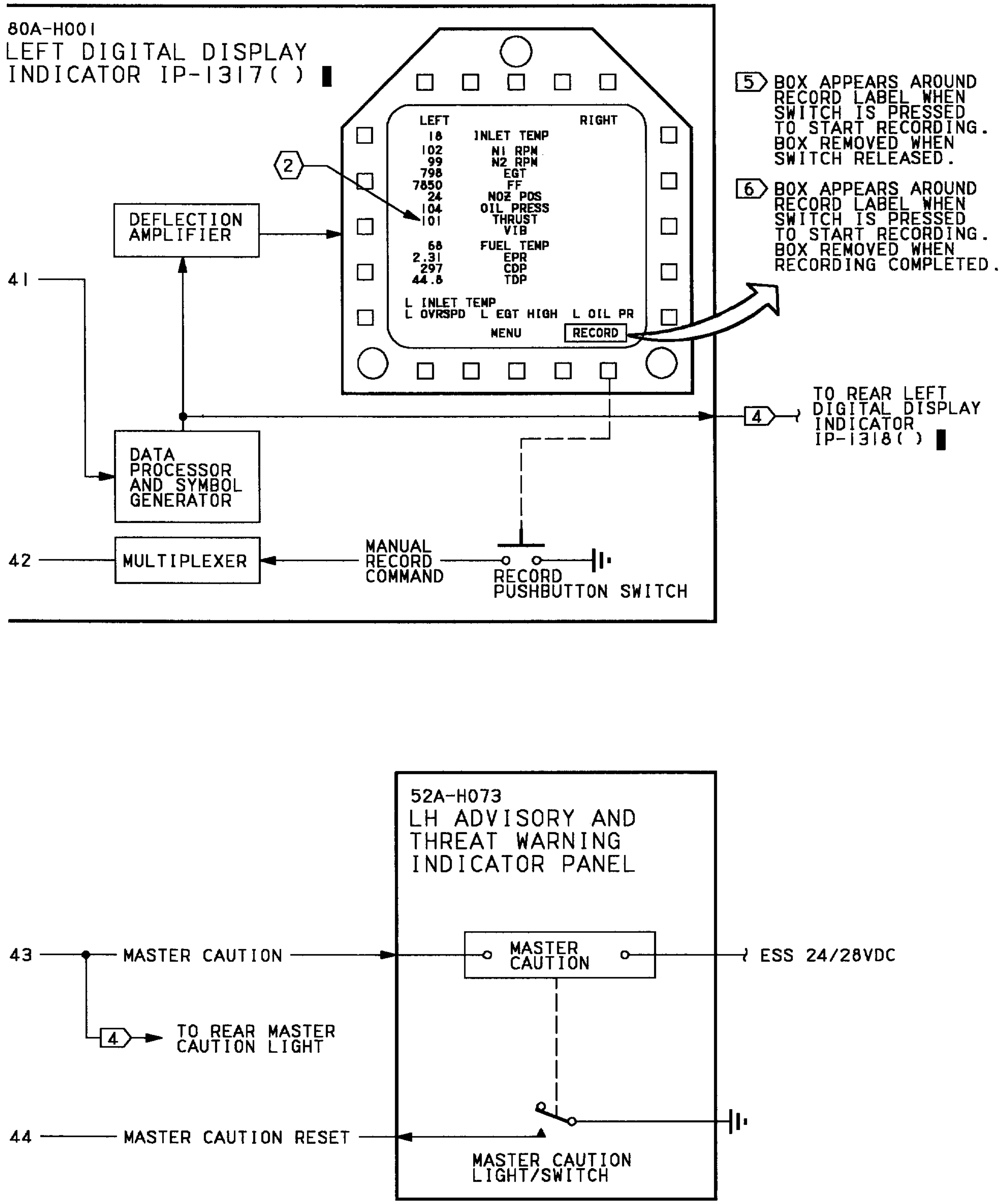


Figure 1. Left Engine Simplified Schematic (Sheet 10)



18AC-580-10-(4-11)13-GRID

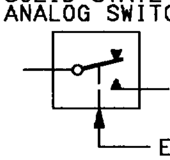
Figure 1. Left Engine Simplified Schematic (Sheet 11)

LEGEND

1. NONSTANDARD SYMBOLS:


TELELIGHT

SOLID STATE
ANALOG SWITCH


ENERGIZING SIGNAL

⟨2⟩ THRUST DATA DISPLAYED ONLY DURING THRUST TEST BEFORE TAKEOFF.

⟨3⟩ RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

[4> F/A-18B.

[5> WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 210.

[6> WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 84A AND UP.

18AC-580-10-(4-12)13-GRID

Figure 1. Left Engine Simplified Schematic (Sheet 12)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - RIGHT ENGINE INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP010 00, dated 15 May 1985.

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

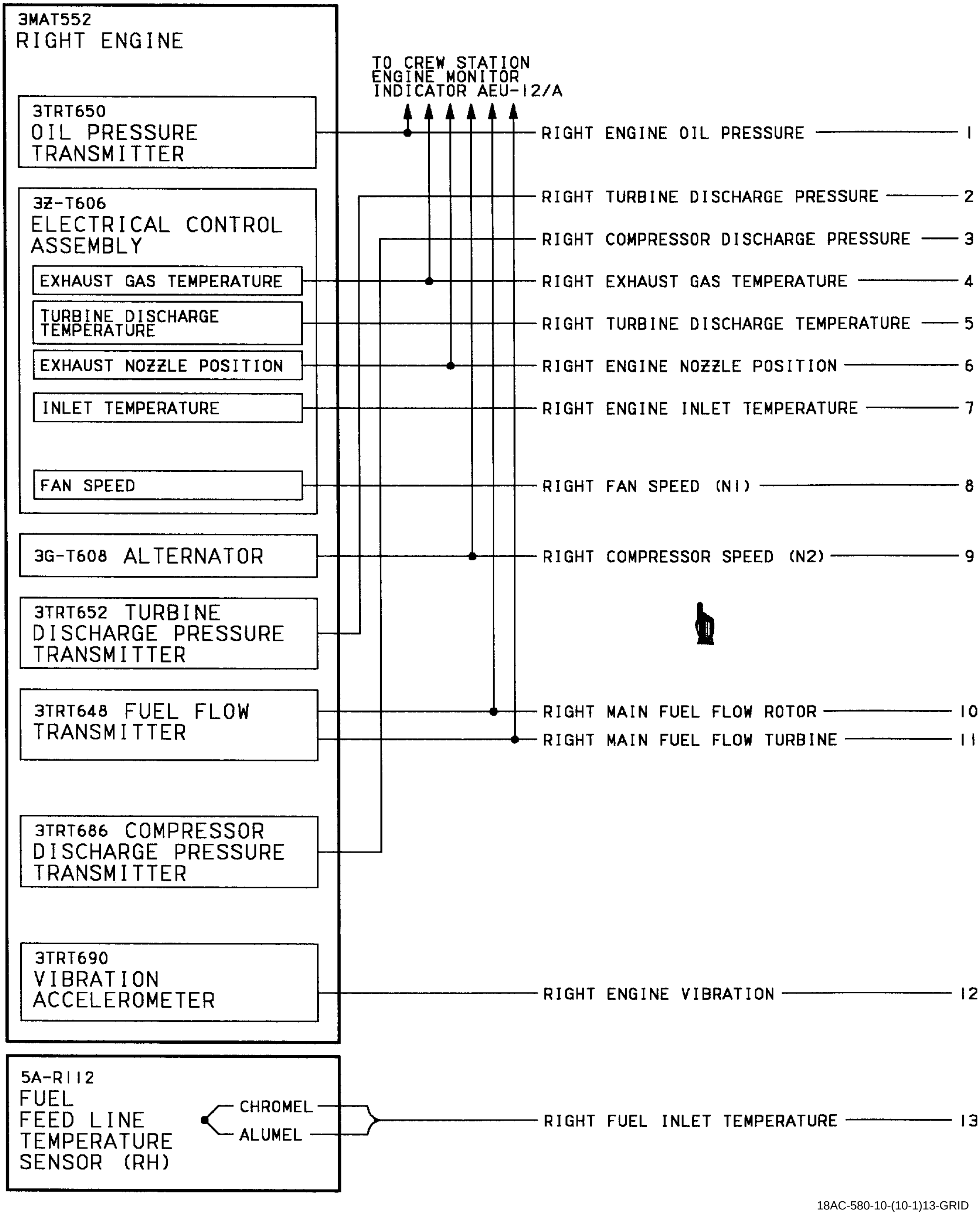
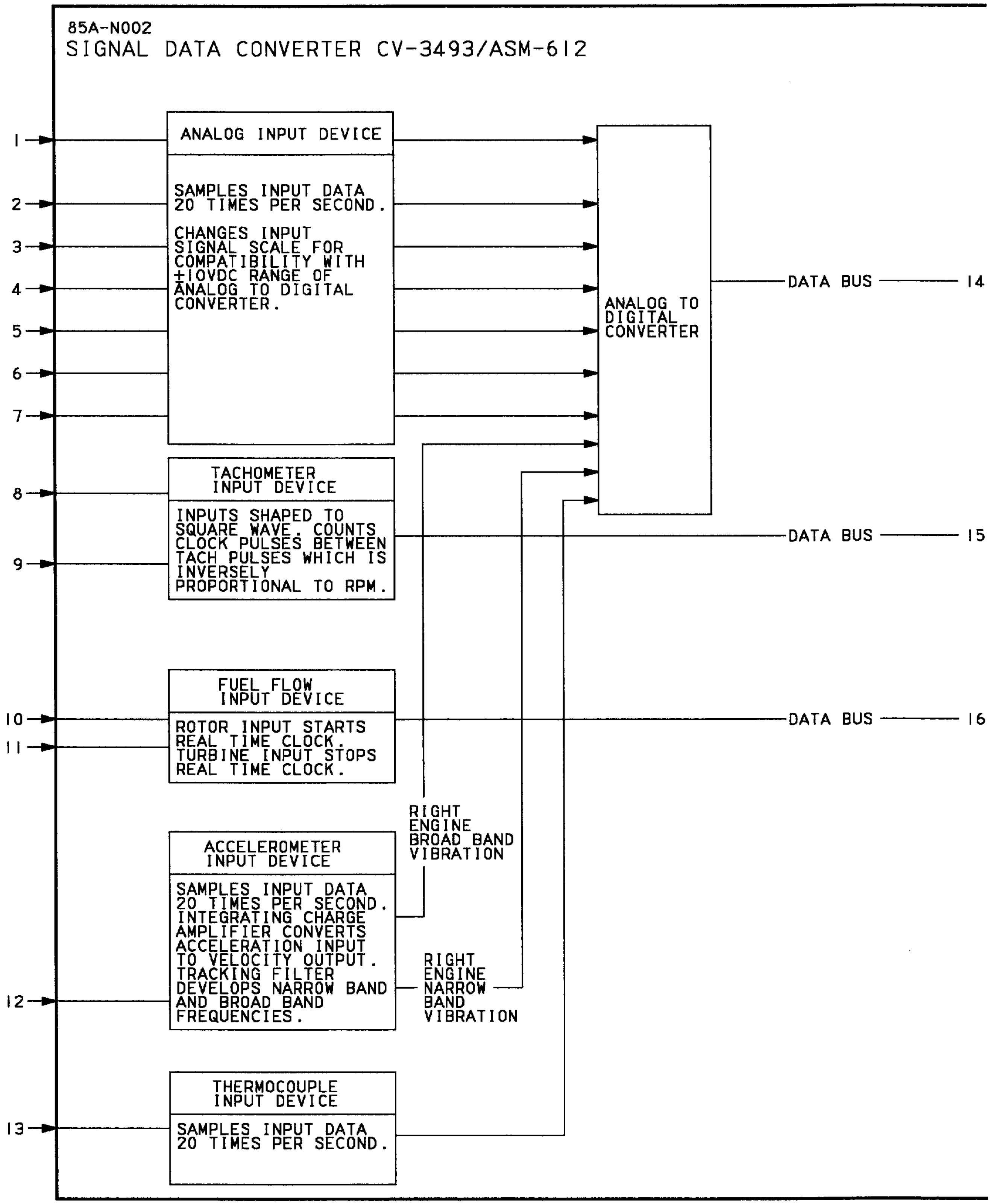
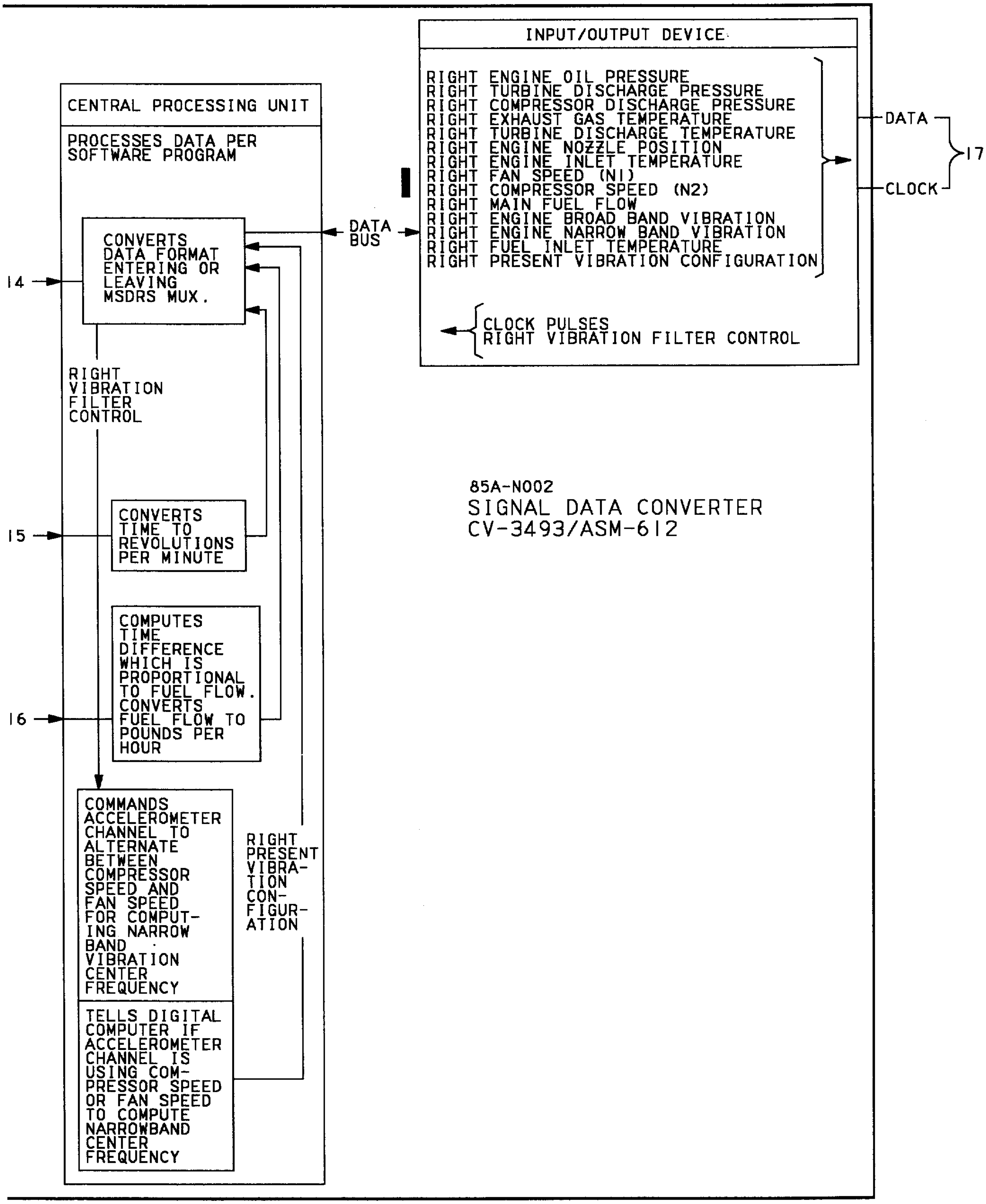


Figure 1. Right Engine Interface Simplified Schematic (Sheet 1)



18AC-580-10-(10-2)A-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 2)



18AC-580-10-(10-3)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 3)

17 ———— 100 KHZ MSDRS MUX ———— 17

85A-G003
DIGITAL DISPLAY INDICATOR ID-2150/ASM-612

ELECTRICALLY ALTERABLE READ ONLY MEMORY-RECEIVES AND STORES MAINTENANCE CODES FOR DISPLAY

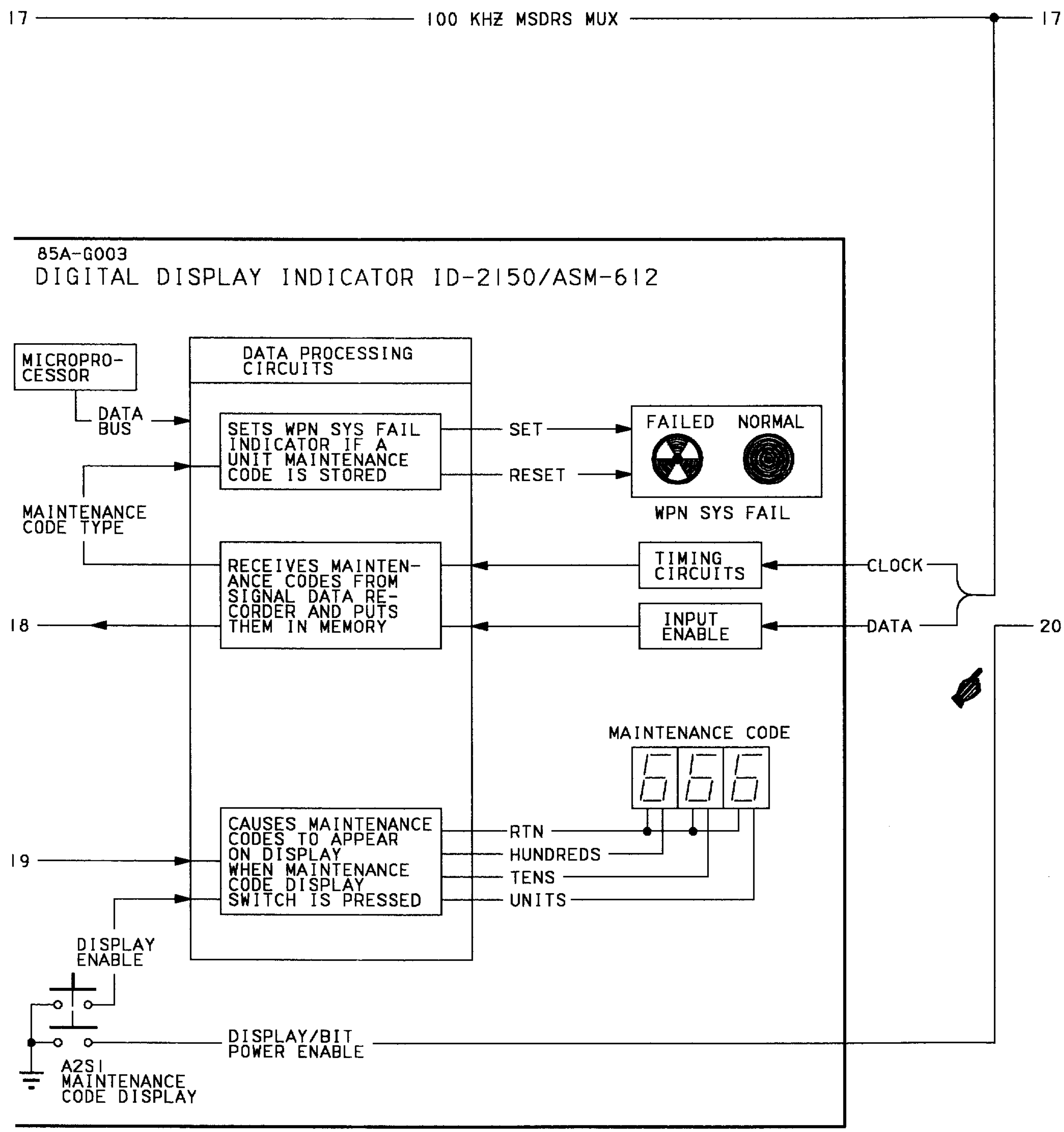
MAINT CODE	MAINTENANCE CODE MESSAGE
666	RIGHT ENGINE FAN SPEED (N1) SIGNAL FAIL
667	RIGHT ENGINE COMPRESSOR SPEED (N2) SIGNAL FAIL
668	RIGHT ENGINE EGT SIGNAL FAIL
674	RIGHT FUEL TEMPERATURE SIGNAL FAIL
675	RIGHT ENGINE COMPRESSOR DISCHARGE PRESSURE SIGNAL FAIL
676	RIGHT ENGINE TURBINE DISCHARGE PRESSURE SIGNAL FAIL
677	RIGHT ENGINE INLET TEMPERATURE SIGNAL FAIL
678	RIGHT ENGINE OIL PRESSURE SIGNAL FAIL
752	RIGHT ENGINE LEVEL 3 EGT OVERTEMP
753	RIGHT ENGINE FAN VIBRATION HIGH
754	RIGHT ENGINE COMPRESSOR VIBRATION HIGH
756	RIGHT ENGINE OIL PRESSURE HIGH
757	RIGHT ENGINE OIL PRESSURE LOW
759	RIGHT ENGINE LEVEL 2 EGT OVERTEMP
760	RIGHT ENGINE LEVEL 3 FAN OVERSPEED
761	RIGHT ENGINE LEVEL 2 FAN OVERSPEED
762	RIGHT ENGINE LEVEL 1 FAN OVERSPEED
763	RIGHT ENGINE LEVEL 3 COMPRESSOR OVERSPEED
764	RIGHT ENGINE LEVEL 2 COMPRESSOR OVERSPEED
765	RIGHT ENGINE LEVEL 1 COMPRESSOR OVERSPEED
766	RIGHT ENGINE FLAMEOUT 6

MAINTENANCE CODES ———— 18

MAINTENANCE CODES ———— 19

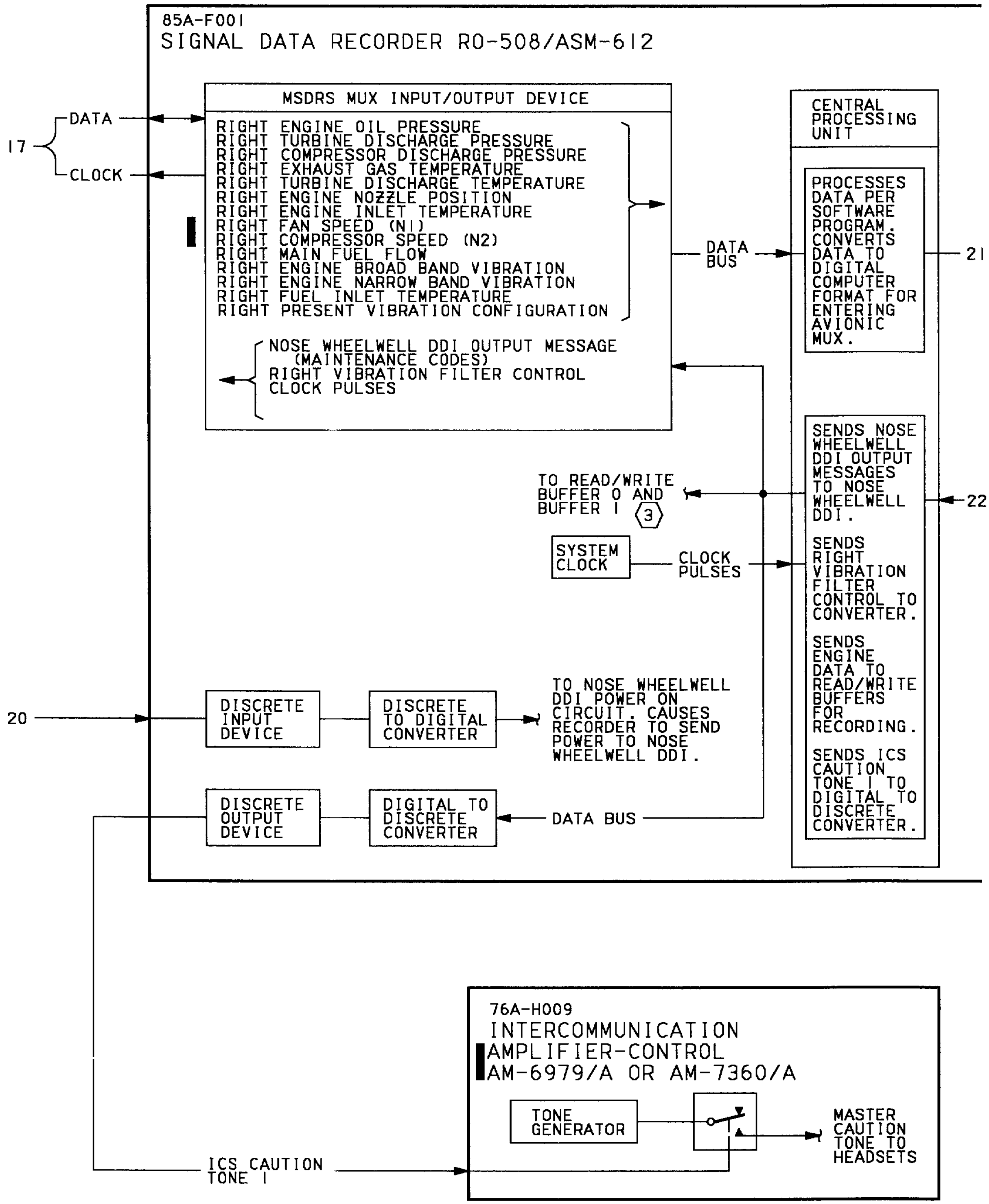
18AC-580-10-(10-4)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 4)



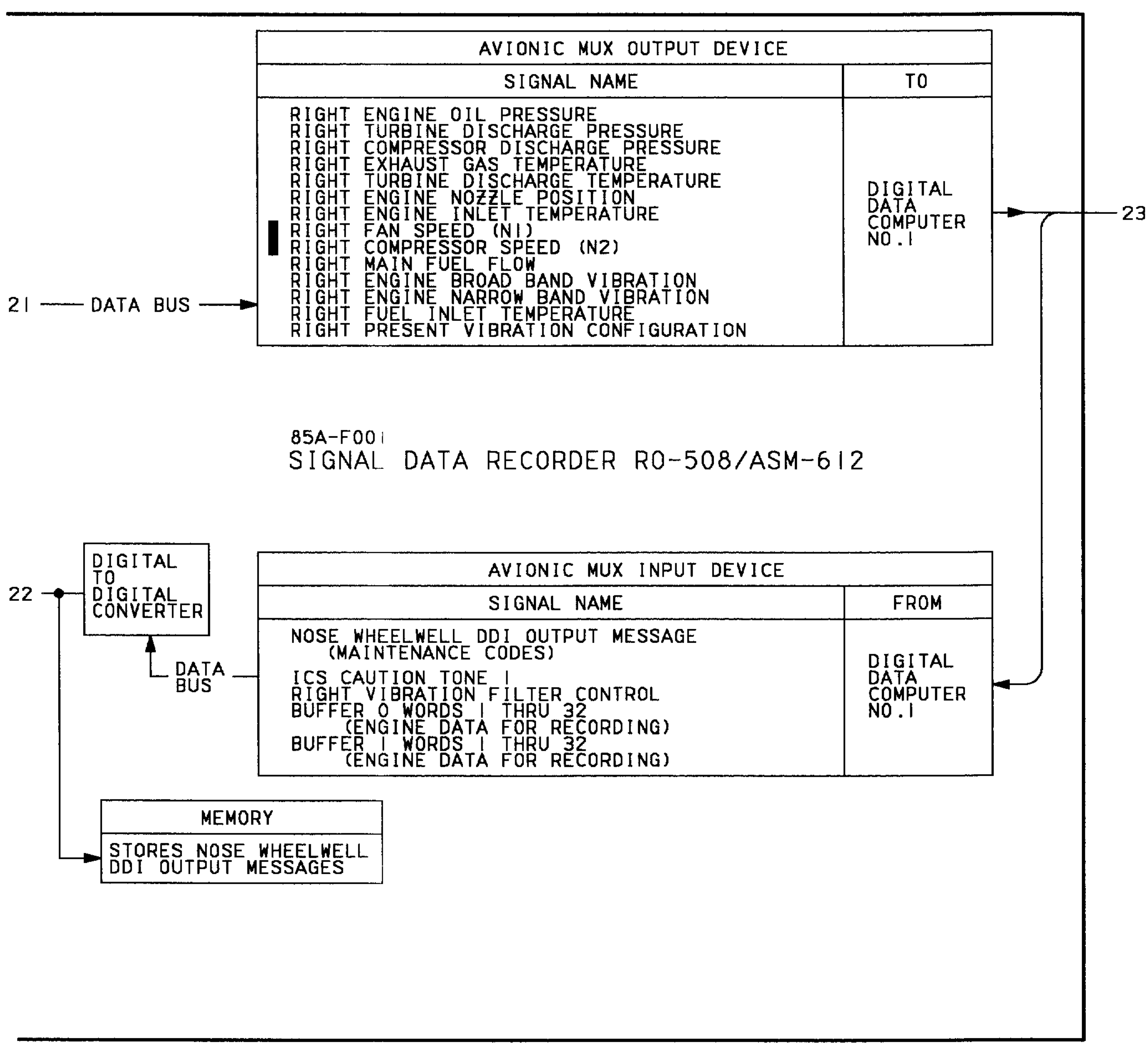
18AC-580-10-(10-5)D-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 5)



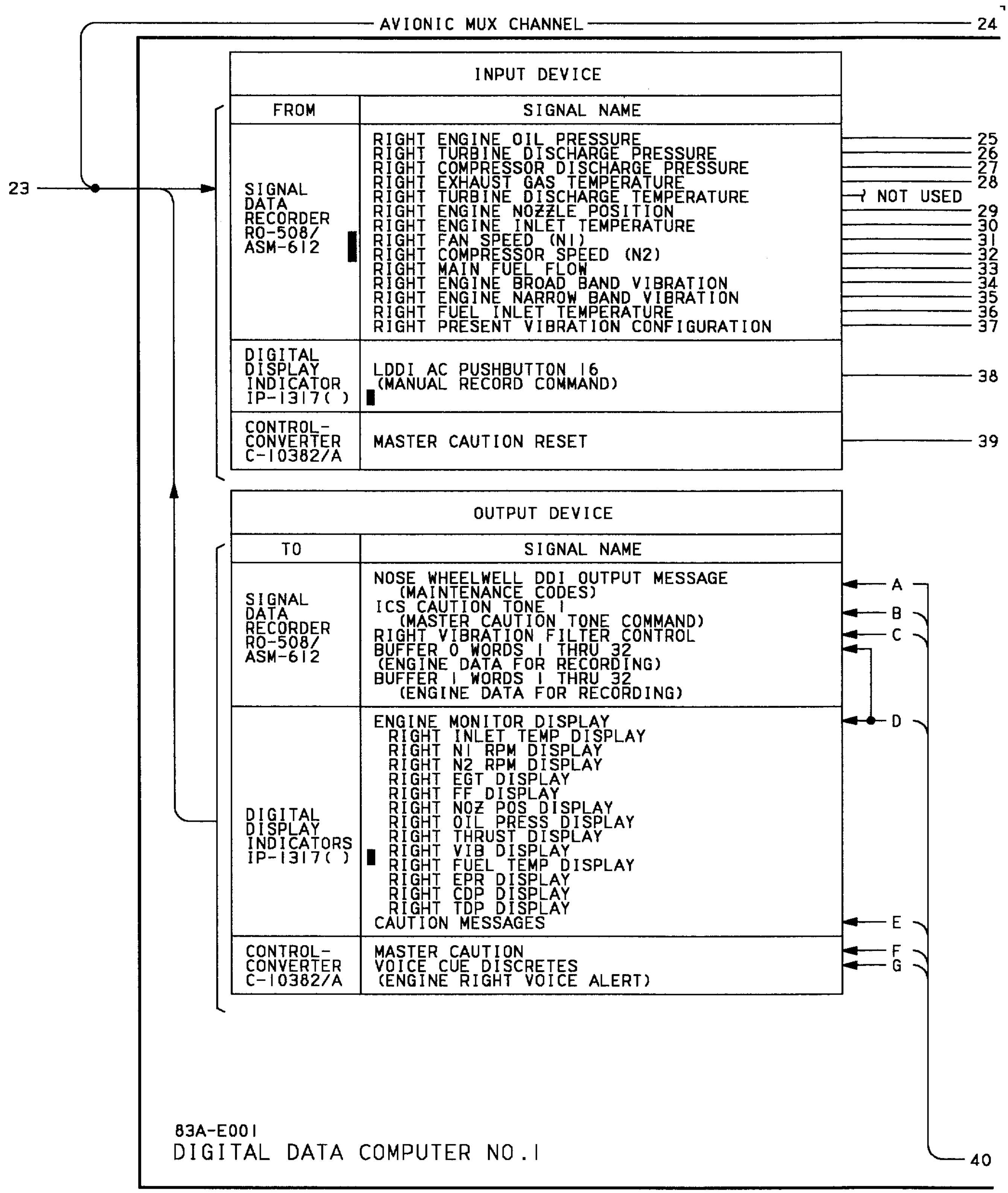
18AC-580-10-(10-6)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 6)



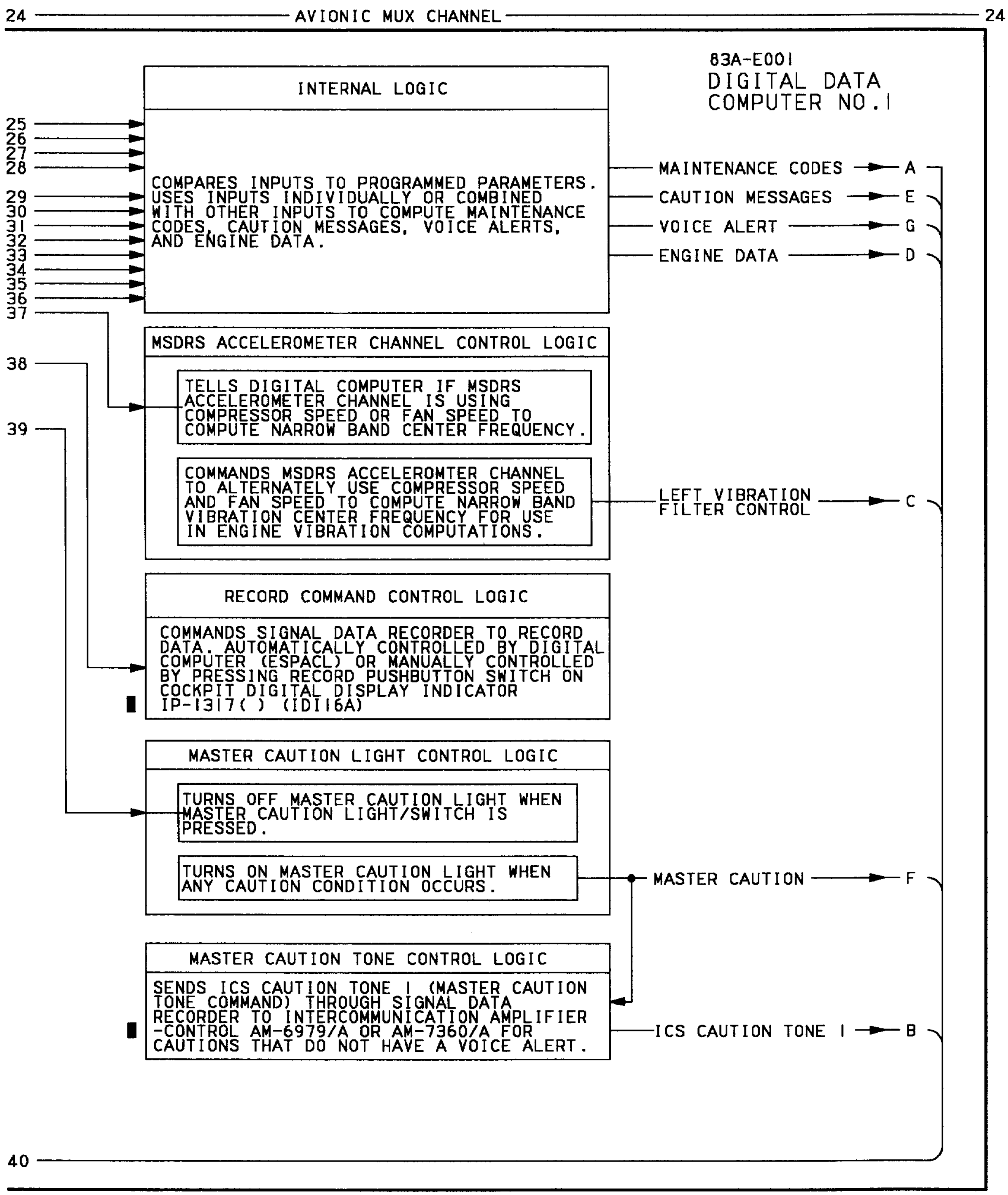
18AC-580-10-(10-7)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 7)



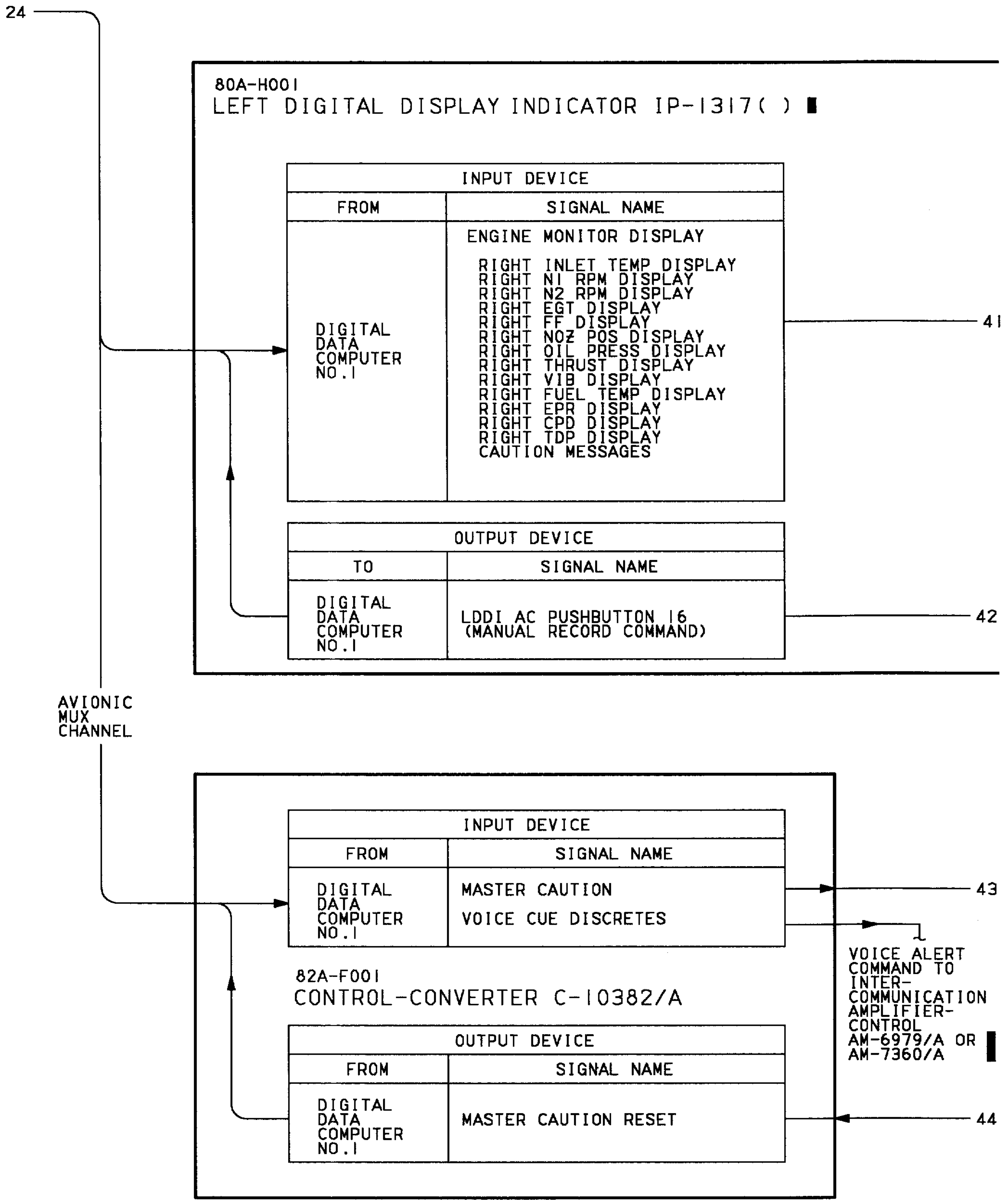
18AC-580-10-(10-8)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 8)



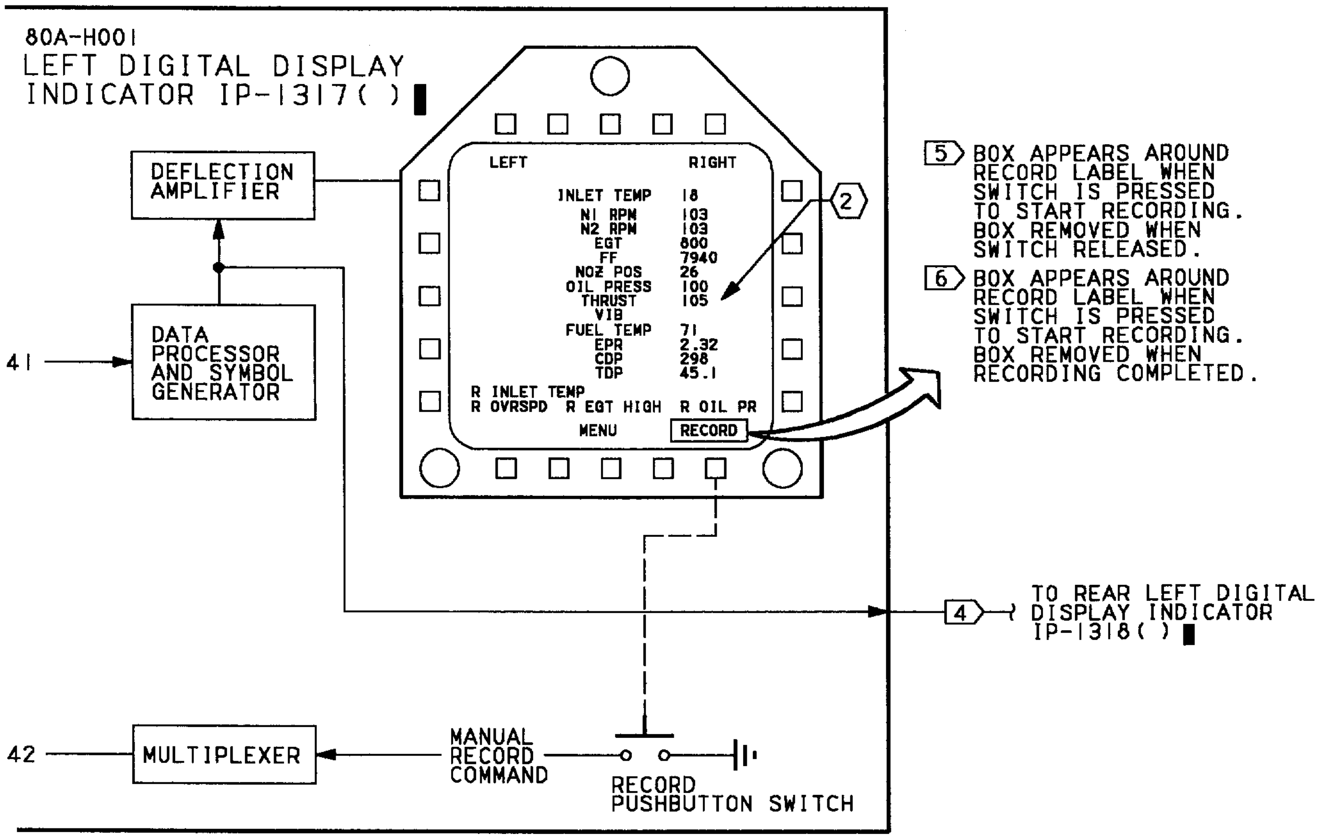
18AC-580-10-(10-9)13-GRID

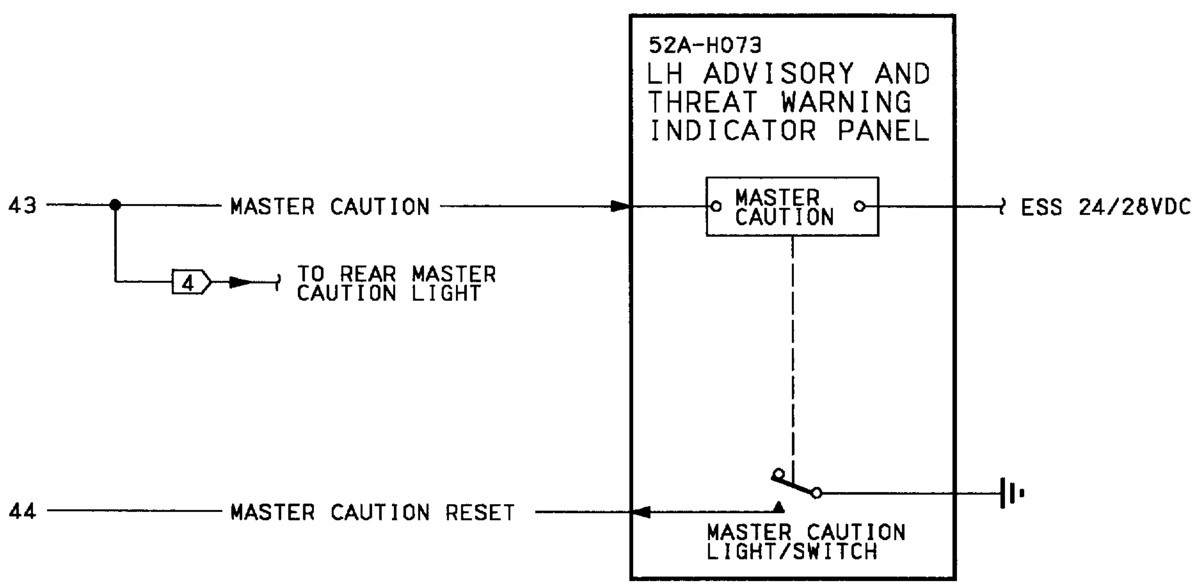
Figure 1. Right Engine Interface Simplified Schematic (Sheet 9)



18AC-580-10-(10-10)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 10)



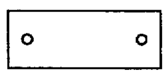


18AC-580-10-(10-11)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 11)

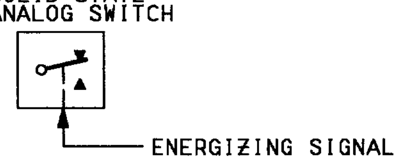
LEGEND

1. NONSTANDARD SYMBOLS



TELELIGHT

SOLID STATE ANALOG SWITCH



2 THRUST DATA DISPLAYED ONLY DURING THRUST TEST BEFORE TAKEOFF.

3 RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

4 F/A-18B.

5 WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 210.

6 WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 84A AND UP.

18AC-580-10-(10-12)13-GRID

Figure 1. Right Engine Interface Simplified Schematic (Sheet 12)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - FUEL SYSTEM INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 56	27 Mar 85	Fuel System Components Replacement and System Inspection (ECP MDA-F18- 00158R1 and ECP MDA-FIA-18-00160)	15 May 85	-
F/A-18 AFC 48	-	Alternating Current Bus Isolation (ECP MDA-F/A-18-00121)	1 Sep 86	ECP coverage only
F/A-18 AFC	-	Motive Flow Fuel Boost Pump Pressure Switch Installation of (ECP MDA-F/A-18- 00158R2 and ECP MDA-F/A-18-00160)	15 Oct 87	ECP coverage only

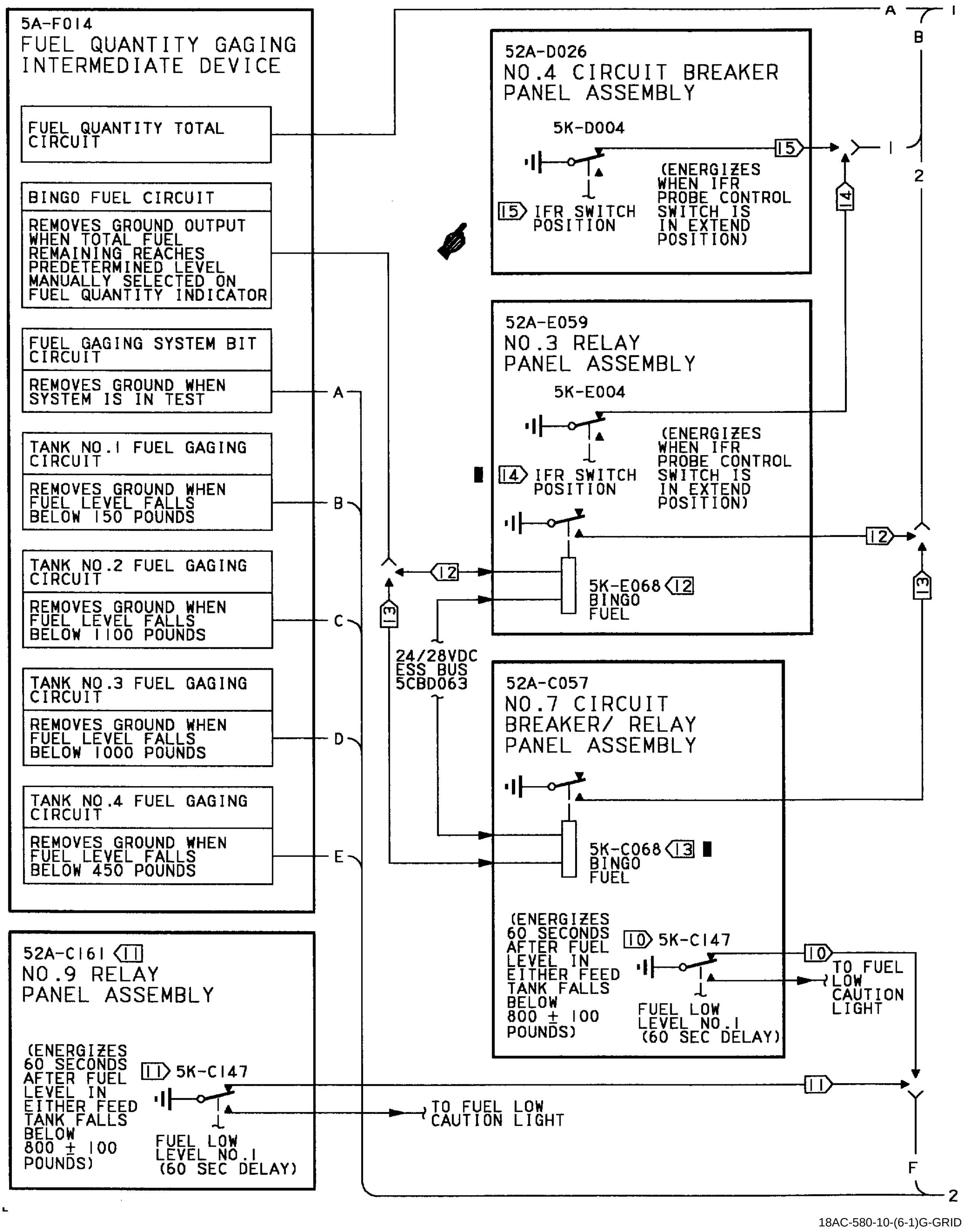
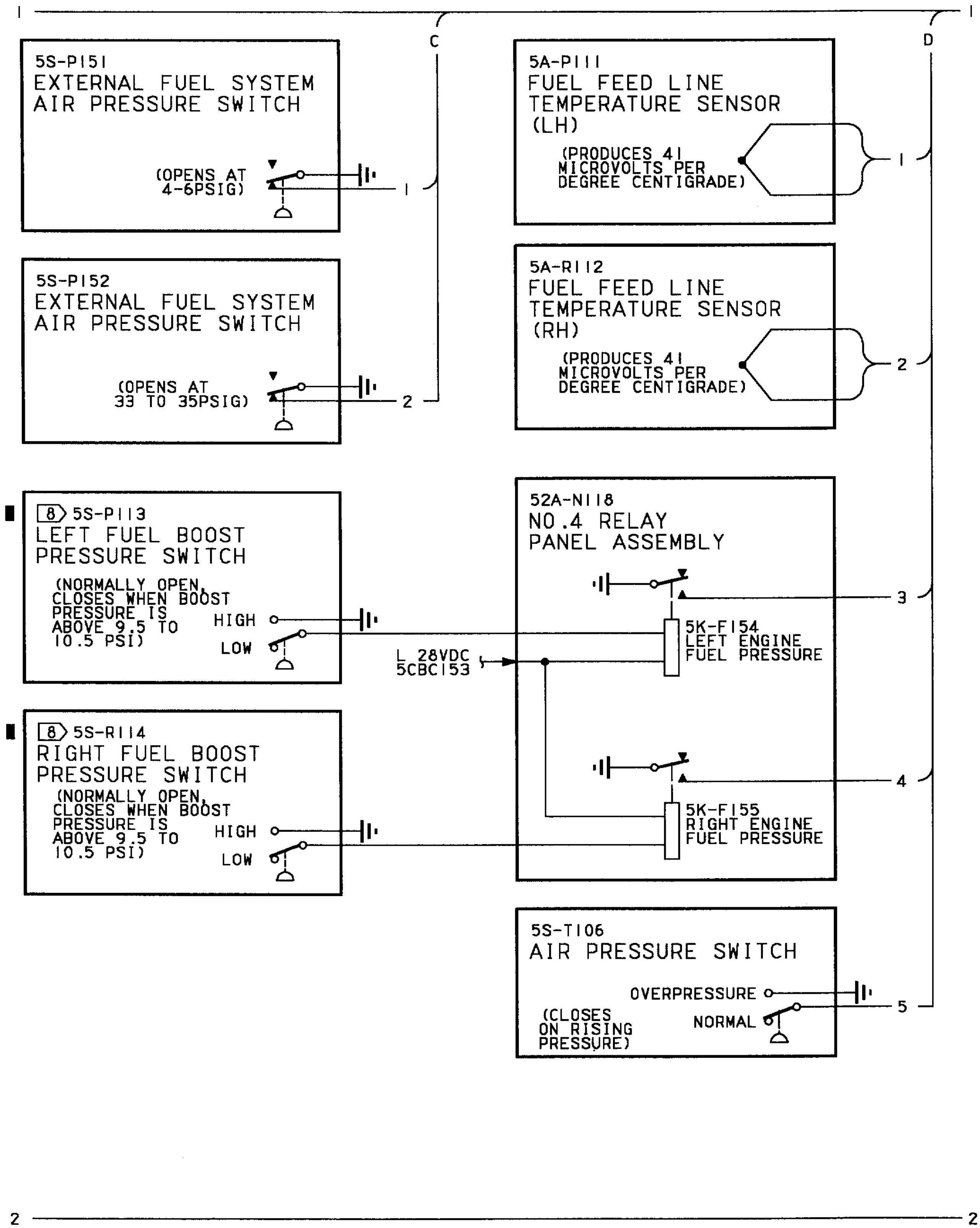
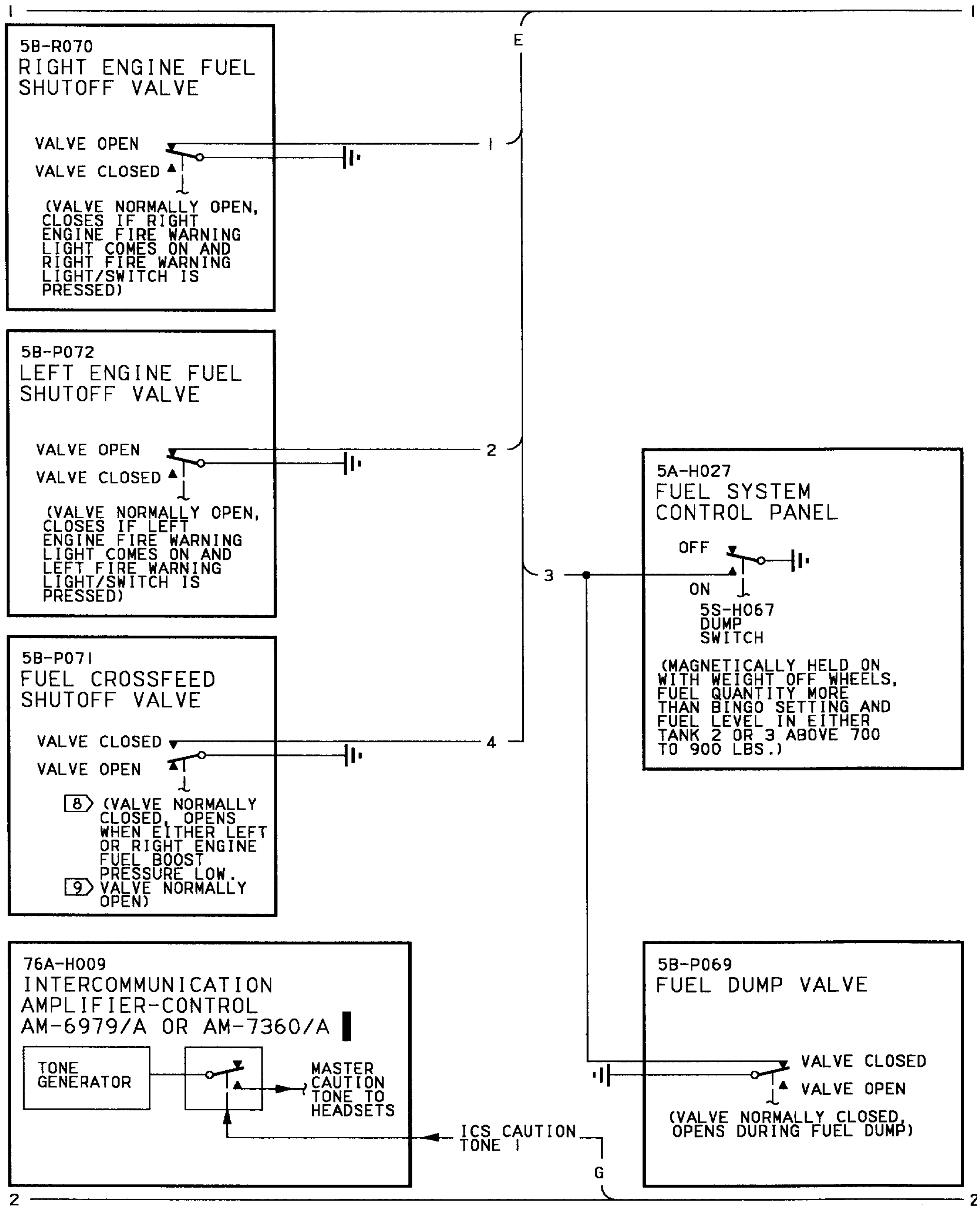


Figure 1. Fuel System Interface Simplified Schematic (Sheet 1)



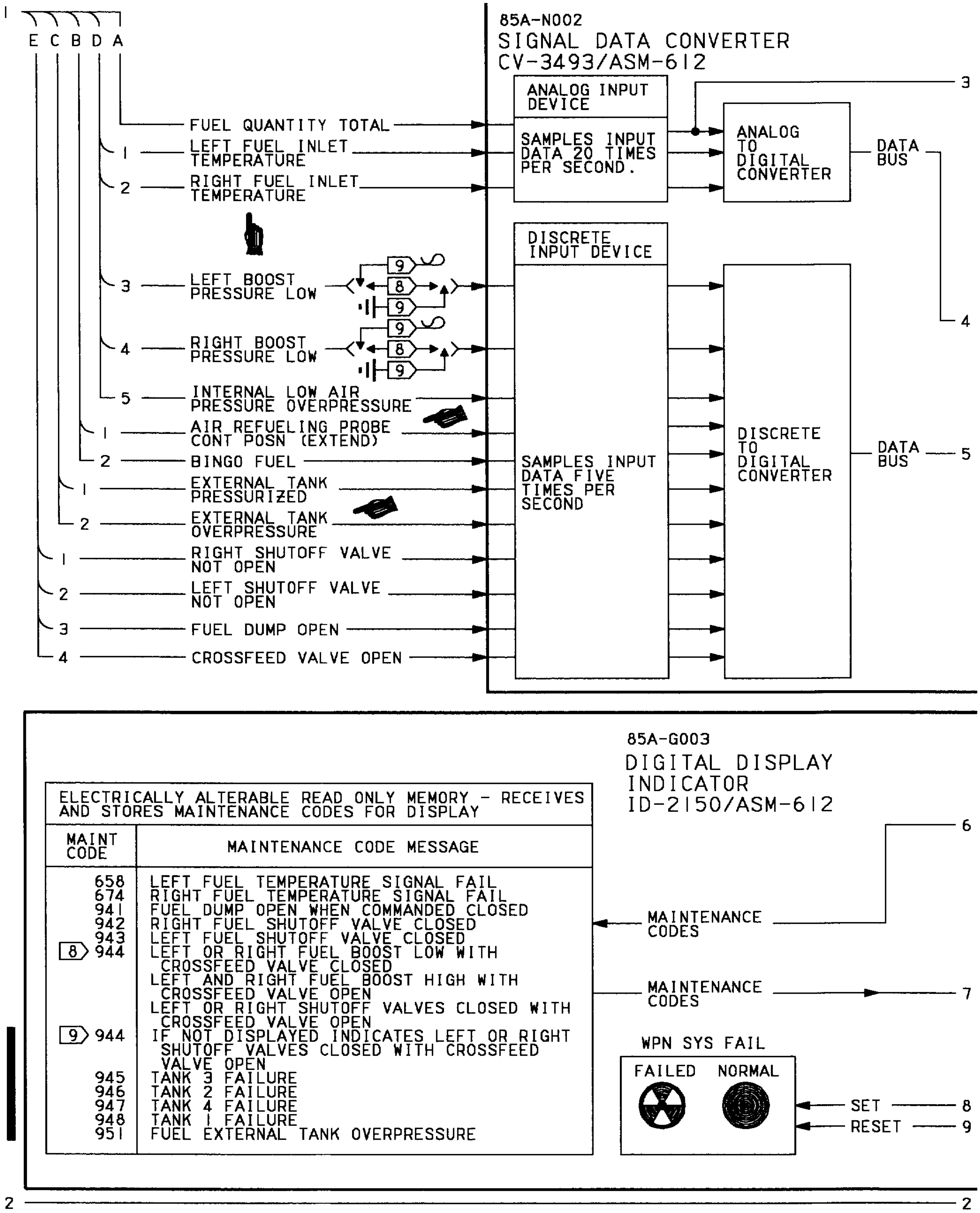
18AC-580-10-(6-2)H-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 2)



18AC-580-10-(6-3)13-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 3)



18AC-580-10-(6-4)E-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 4)

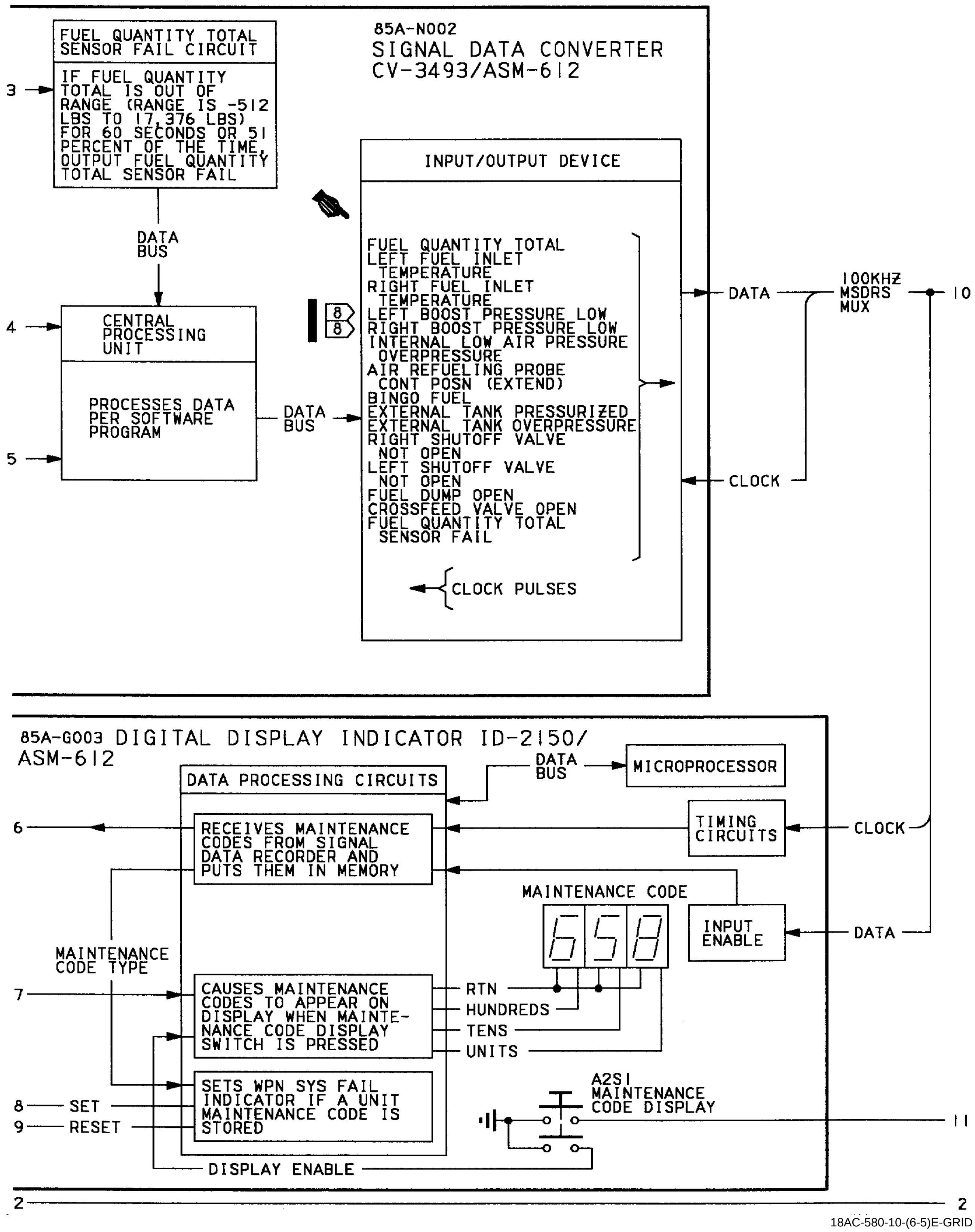


Figure 1. Fuel System Interface Simplified Schematic (Sheet 5)

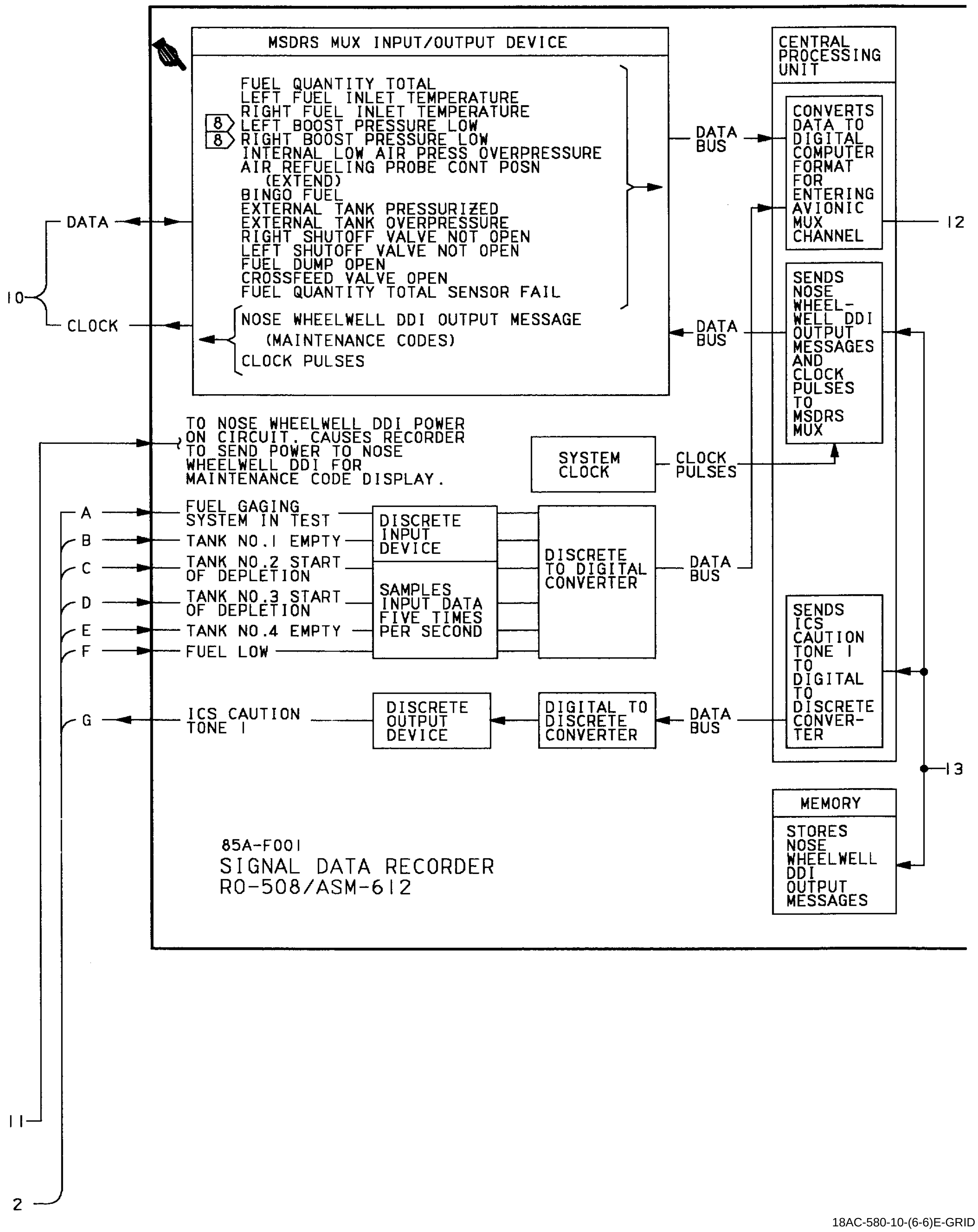
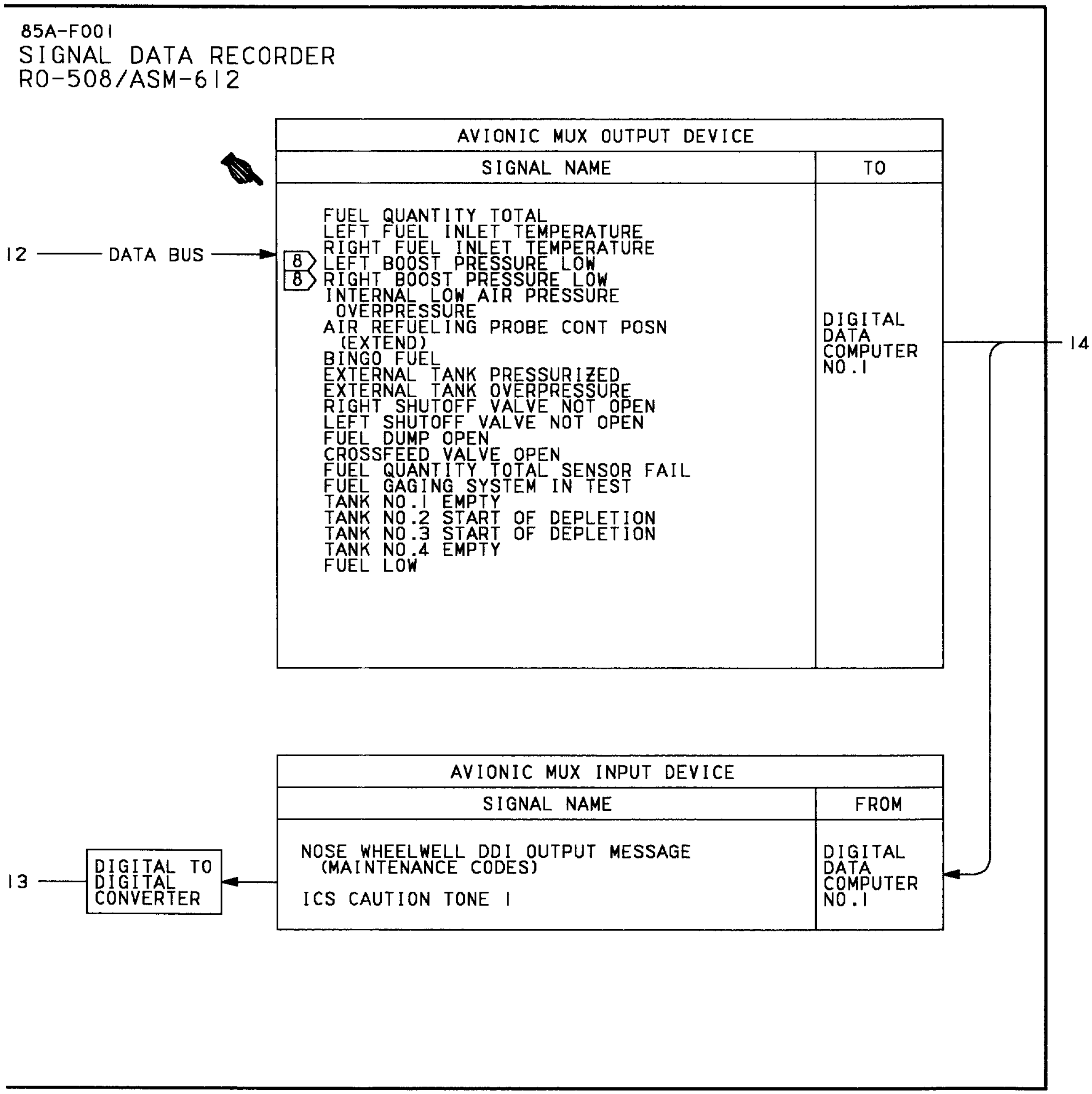
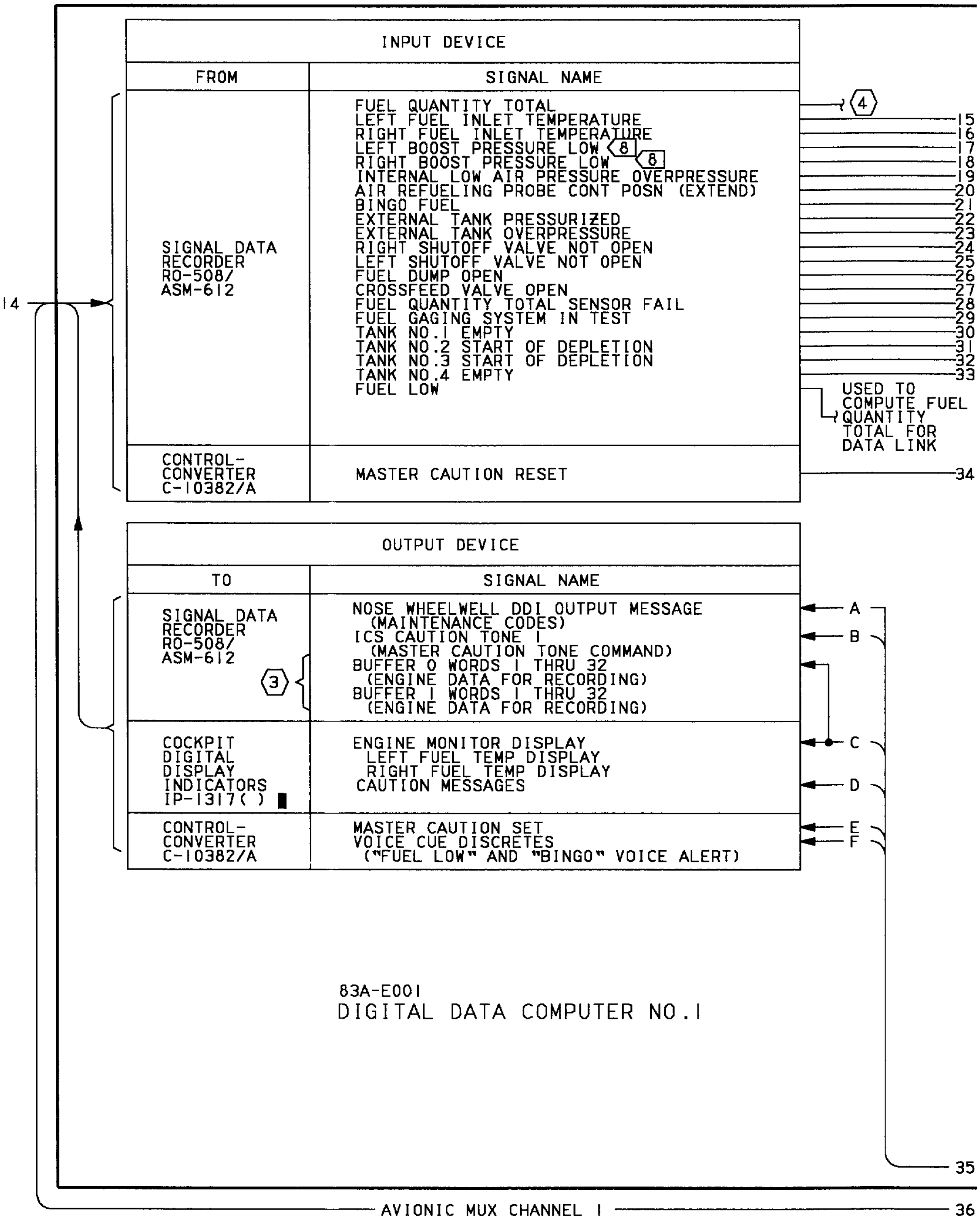


Figure 1. Fuel System Interface Simplified Schematic (Sheet 6)



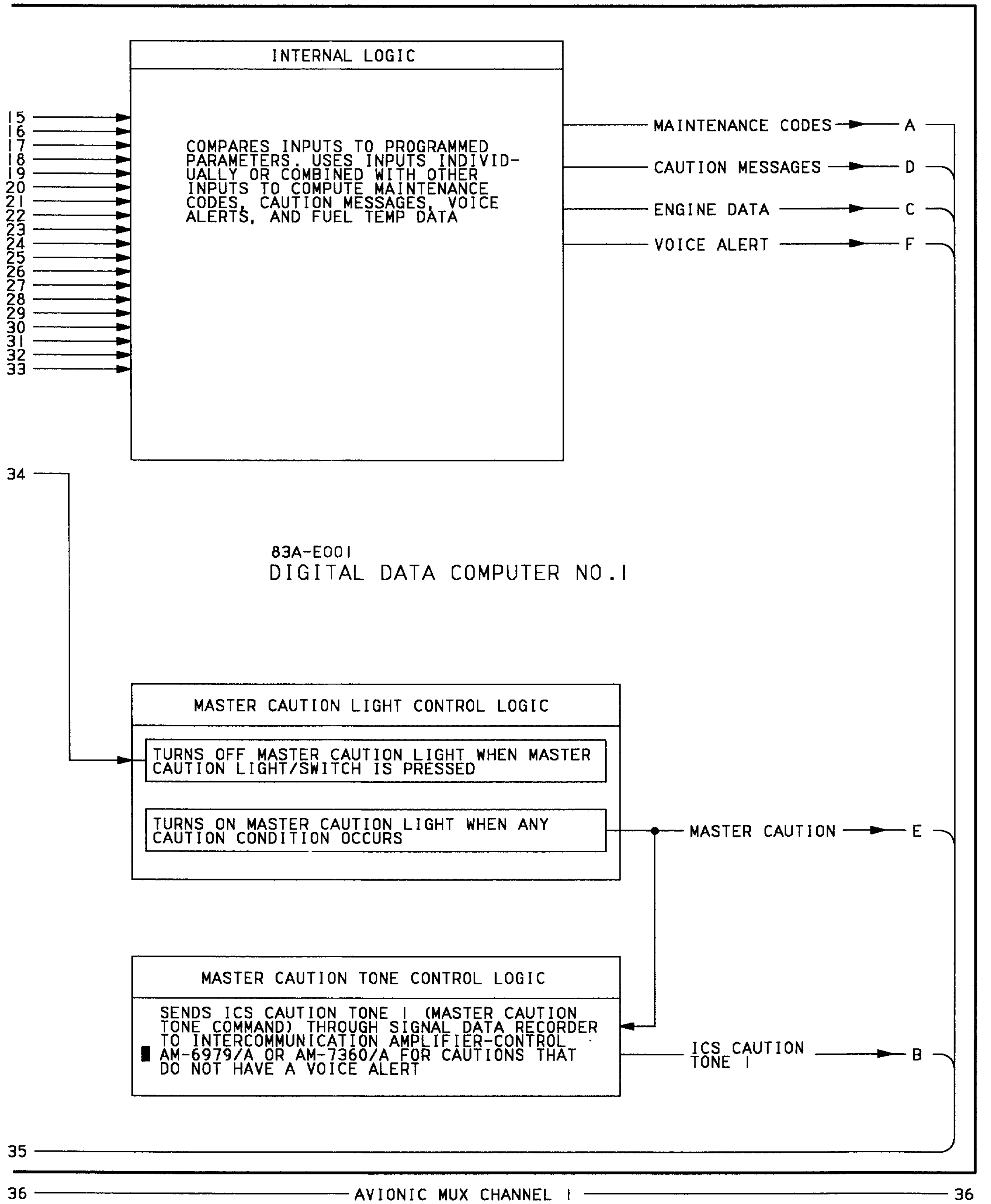
18AC-580-10-(6-7)E-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 7)



18AC-580-10-(6-8)F-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 8)



18AC-580-10-(6-9)13-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 9)

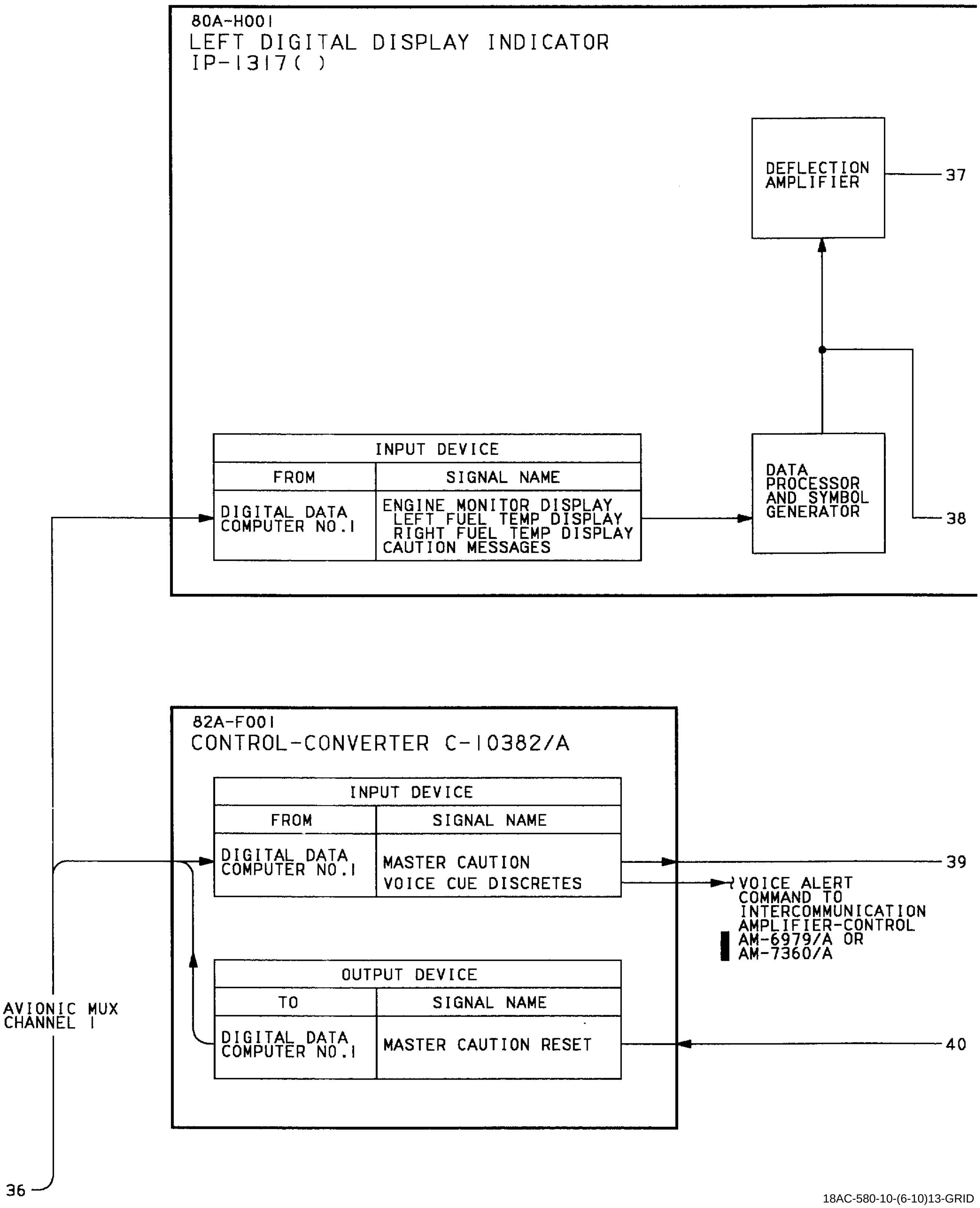
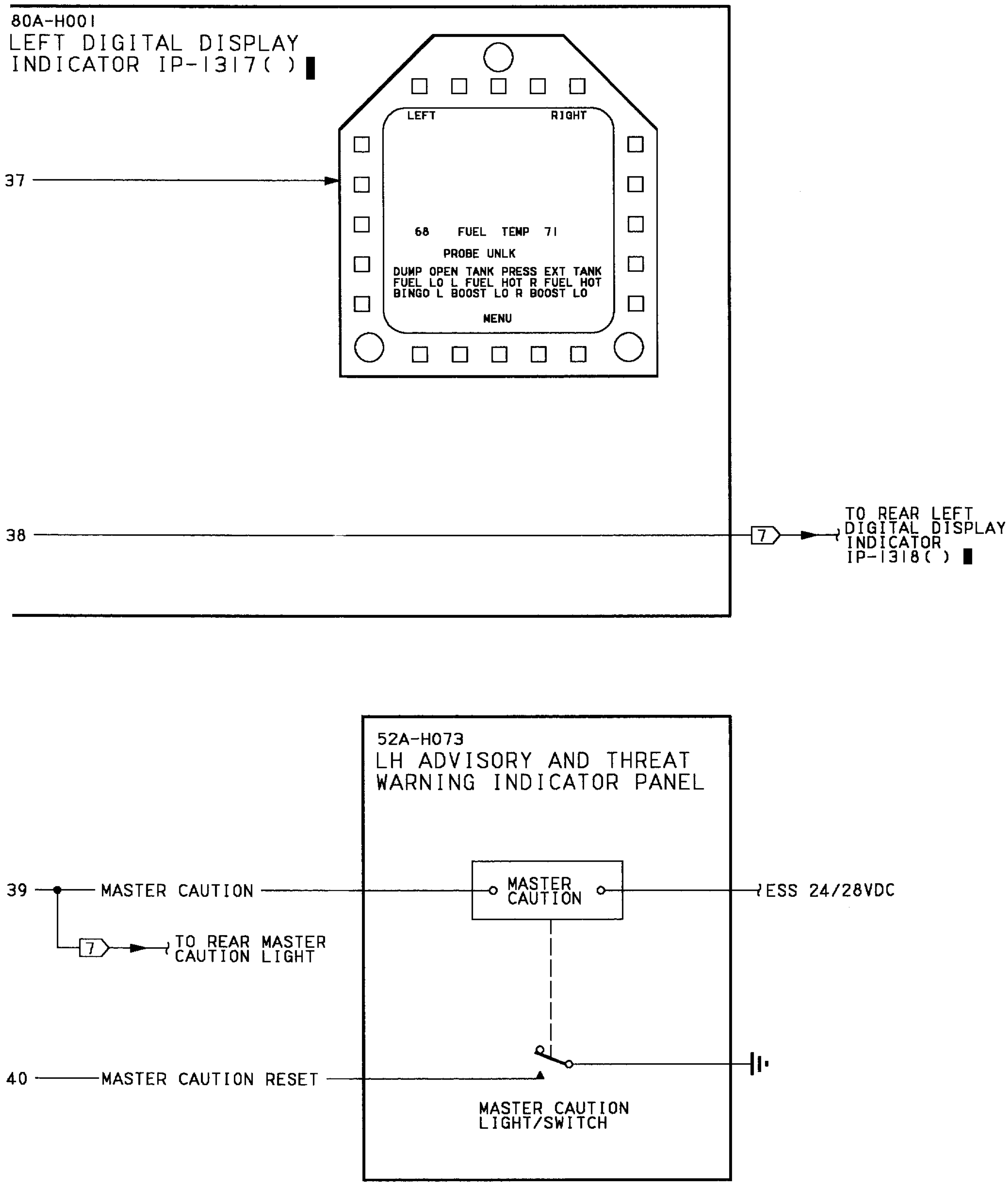


Figure 1. Fuel System Interface Simplified Schematic (Sheet 10)

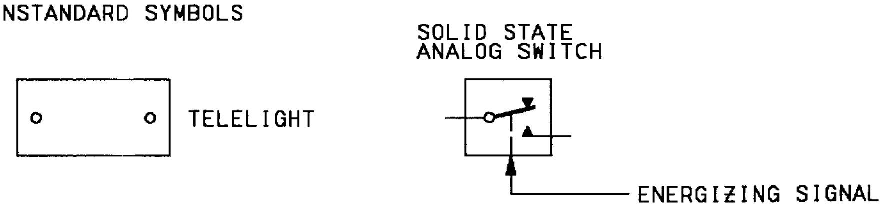


18AC-580-10-(6-11)F-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 11)

LEGEND

1. NONSTANDARD SYMBOLS



(2) DELETED.

(3) RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

(4) FATIGUE STRAIN DATA SIMPLIFIED SCHEMATIC, WP012 00.

[5] DELETED.

[6] DELETED.

[7] F/A-18B.

[8] 163119 AND UP; ALSO 161353 THRU 161924 BEFORE F18 IAFC 056, OR 161353 THRU 163118 AFTER F18 AFC 070.

[9] 161353 THRU 161924 AFTER F18 IAFC 056, OR 161353 THRU 163118 BEFORE F18 AFC 070.

[10] 161353 THRU 161987 BEFORE F18 AFC 48.

[11] 162394 AND UP, ALSO 161353 THRU 161987 AFTER F18 AFC 48.

[12] 161353 THRU 161761.

[13] 161924 AND UP.

[14] 161353 THRU 162909.

[15] 163092 AND UP.

18AC-580-10-(6-12)H-GRID

Figure 1. Fuel System Interface Simplified Schematic (Sheet 12)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - FATIGUE STRAIN DATA

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP012 00, dated 15 June 1986.

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - FATIGUE STRAIN DATA

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 87X AND UP

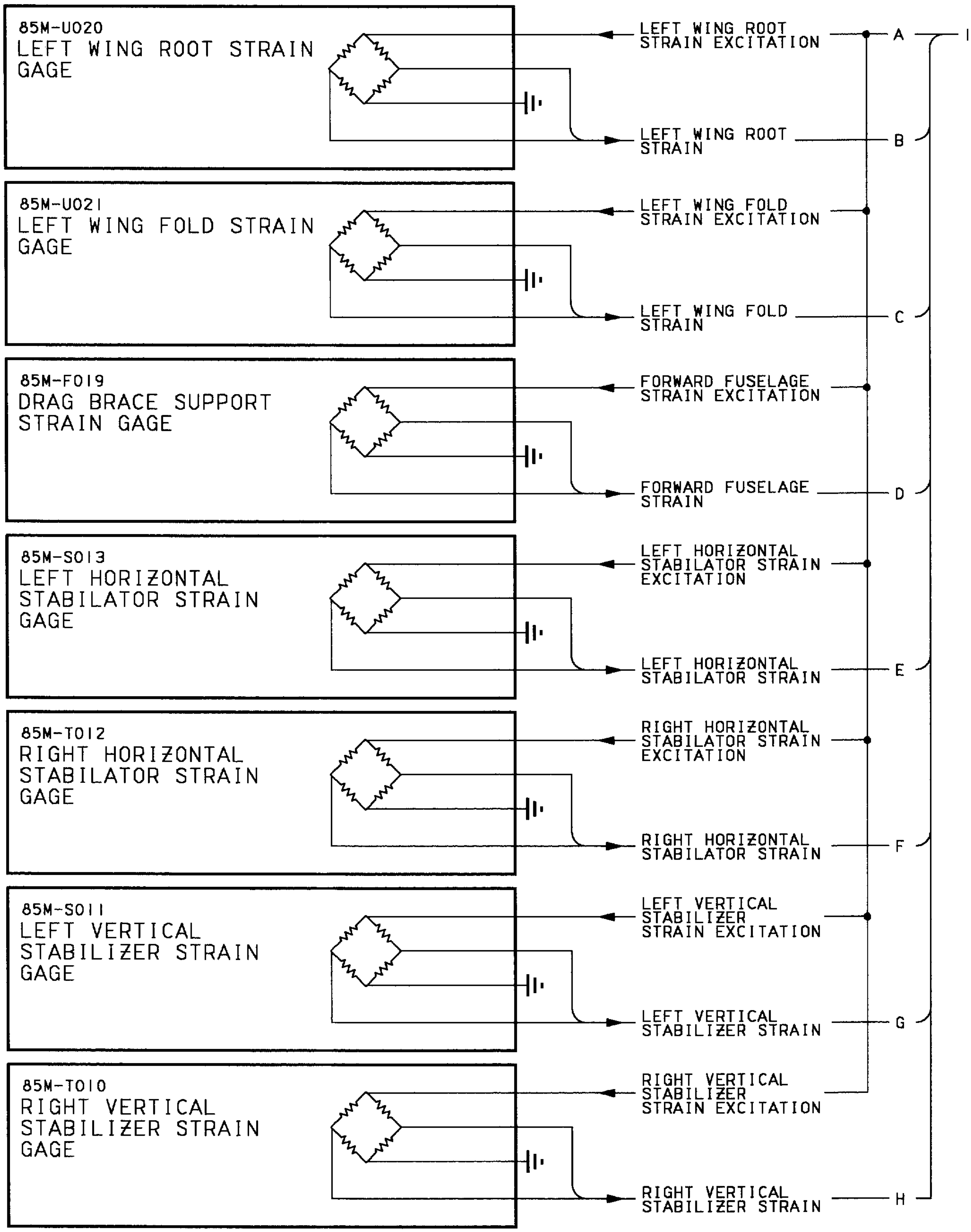
Reference Material

None

Alphabetical Index

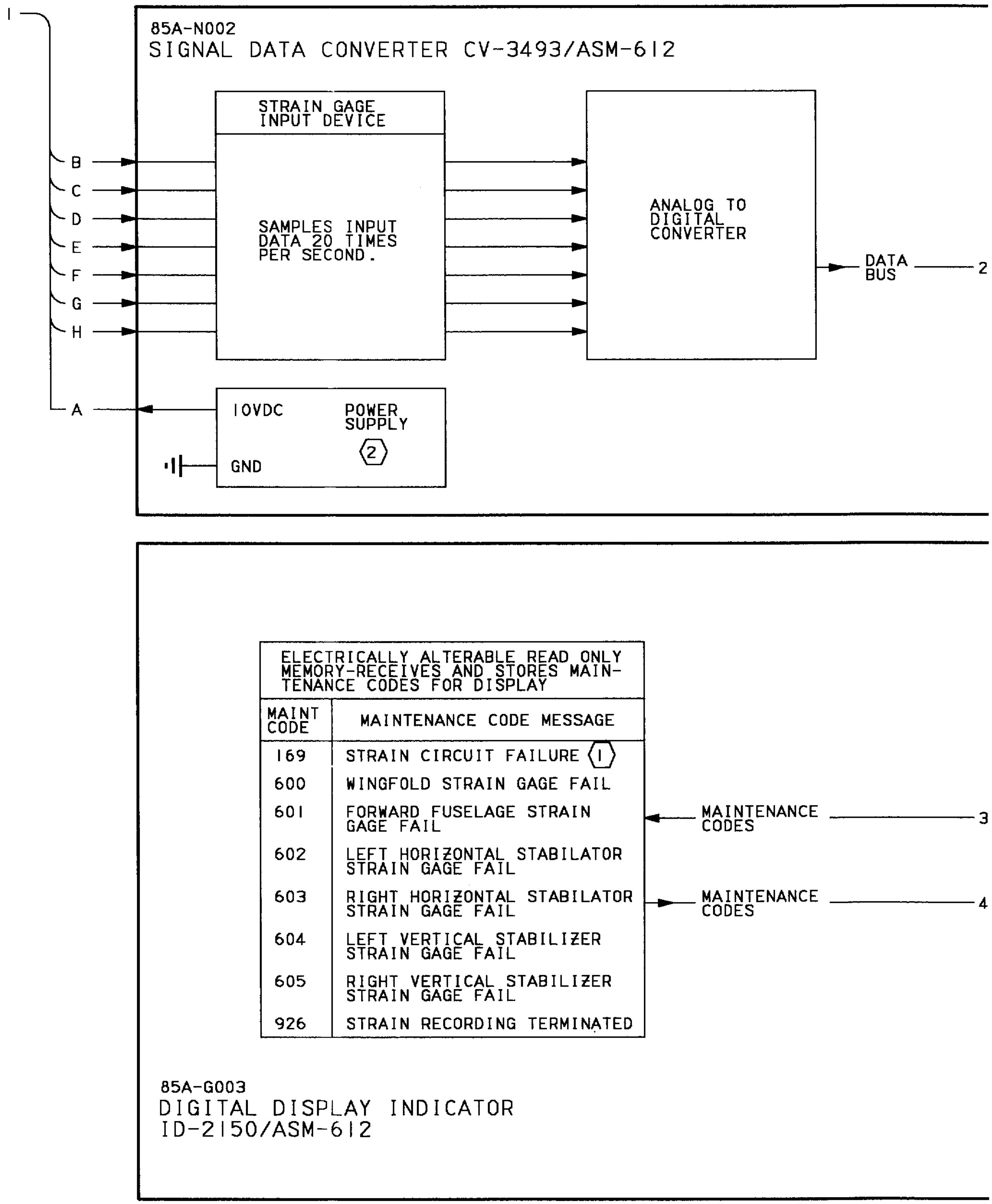
Record of Applicable Technical Directives

None



18AC-580-10-(21-1)-GRID

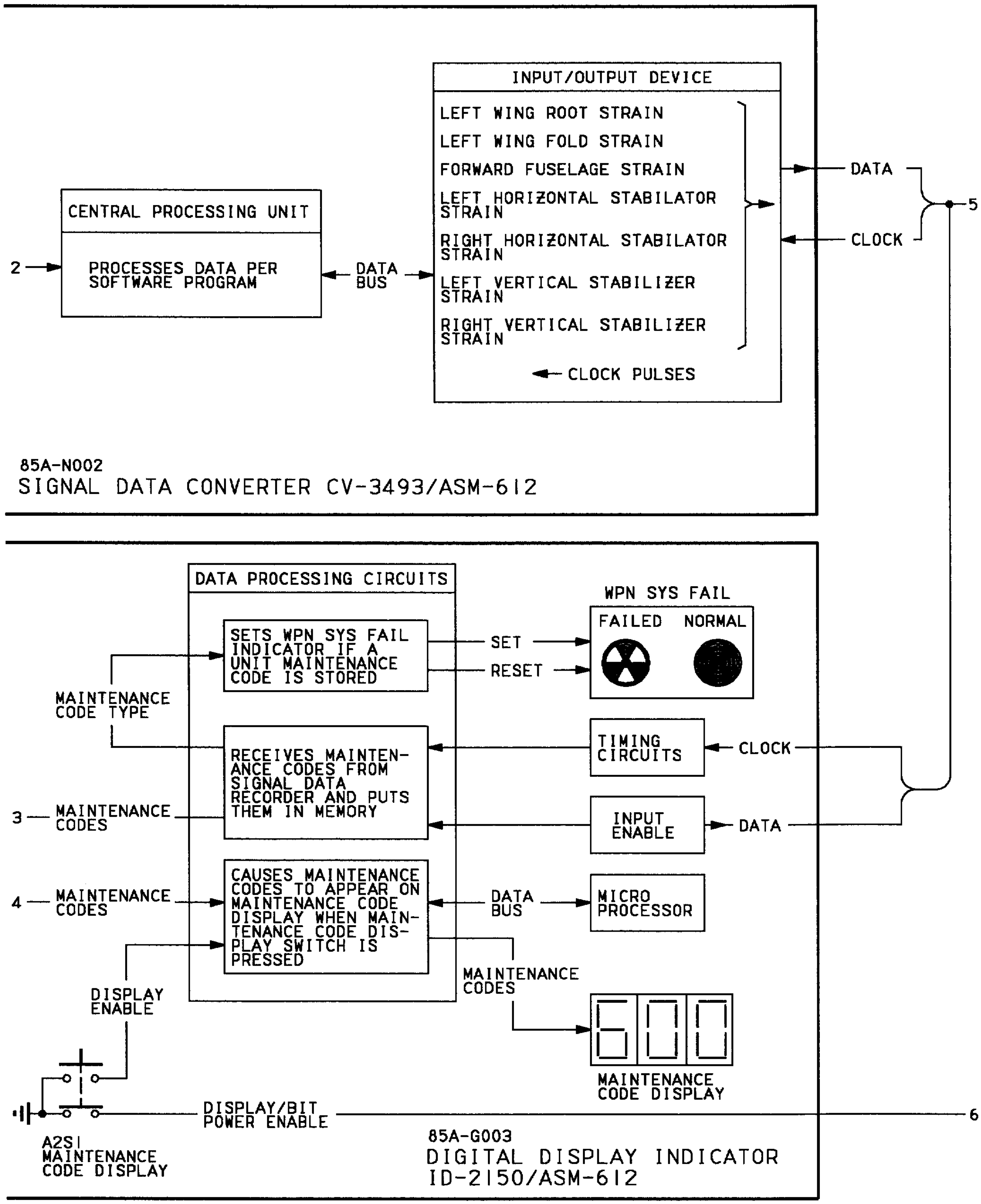
Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 1)



MAINT CODE	MAINTENANCE CODE MESSAGE
169	STRAIN CIRCUIT FAILURE 1
600	WINGFOLD STRAIN GAGE FAIL
601	FORWARD FUSELAGE STRAIN GAGE FAIL
602	LEFT HORIZONTAL STABILATOR STRAIN GAGE FAIL
603	RIGHT HORIZONTAL STABILATOR STRAIN GAGE FAIL
604	LEFT VERTICAL STABILIZER STRAIN GAGE FAIL
605	RIGHT VERTICAL STABILIZER STRAIN GAGE FAIL
926	STRAIN RECORDING TERMINATED

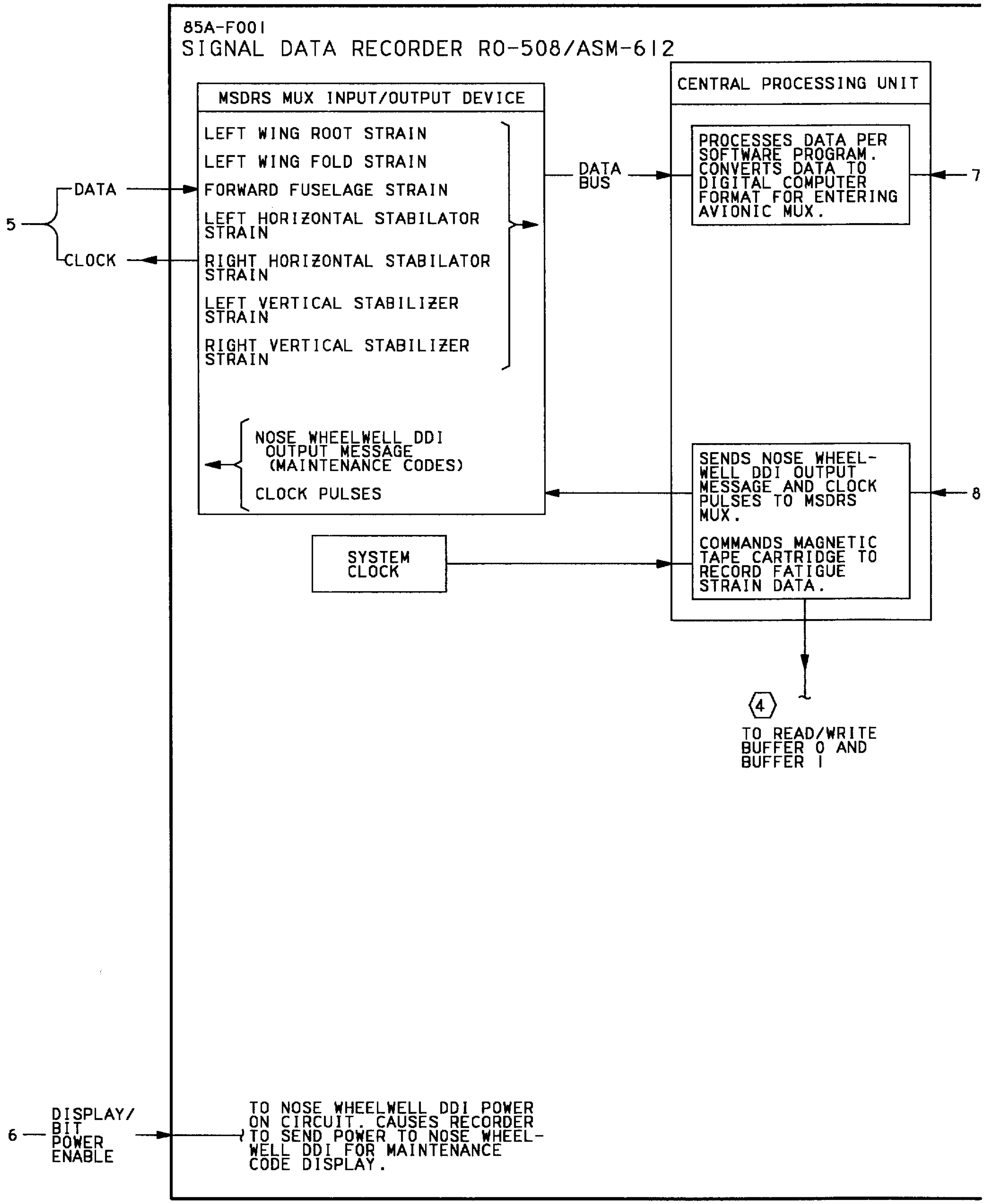
18AC-580-10-(21-2)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 2)



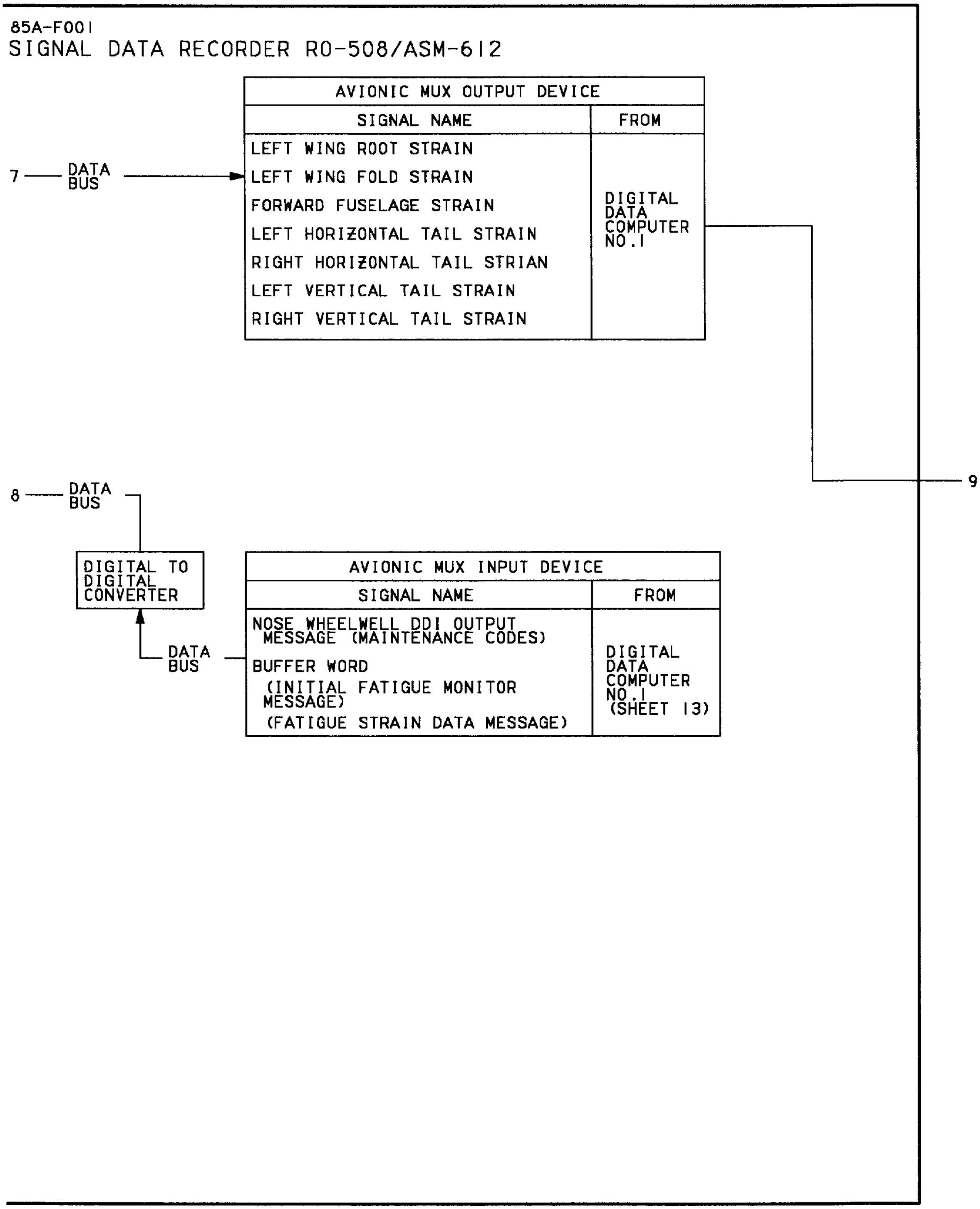
18AC-580-10-(21-3)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 3)



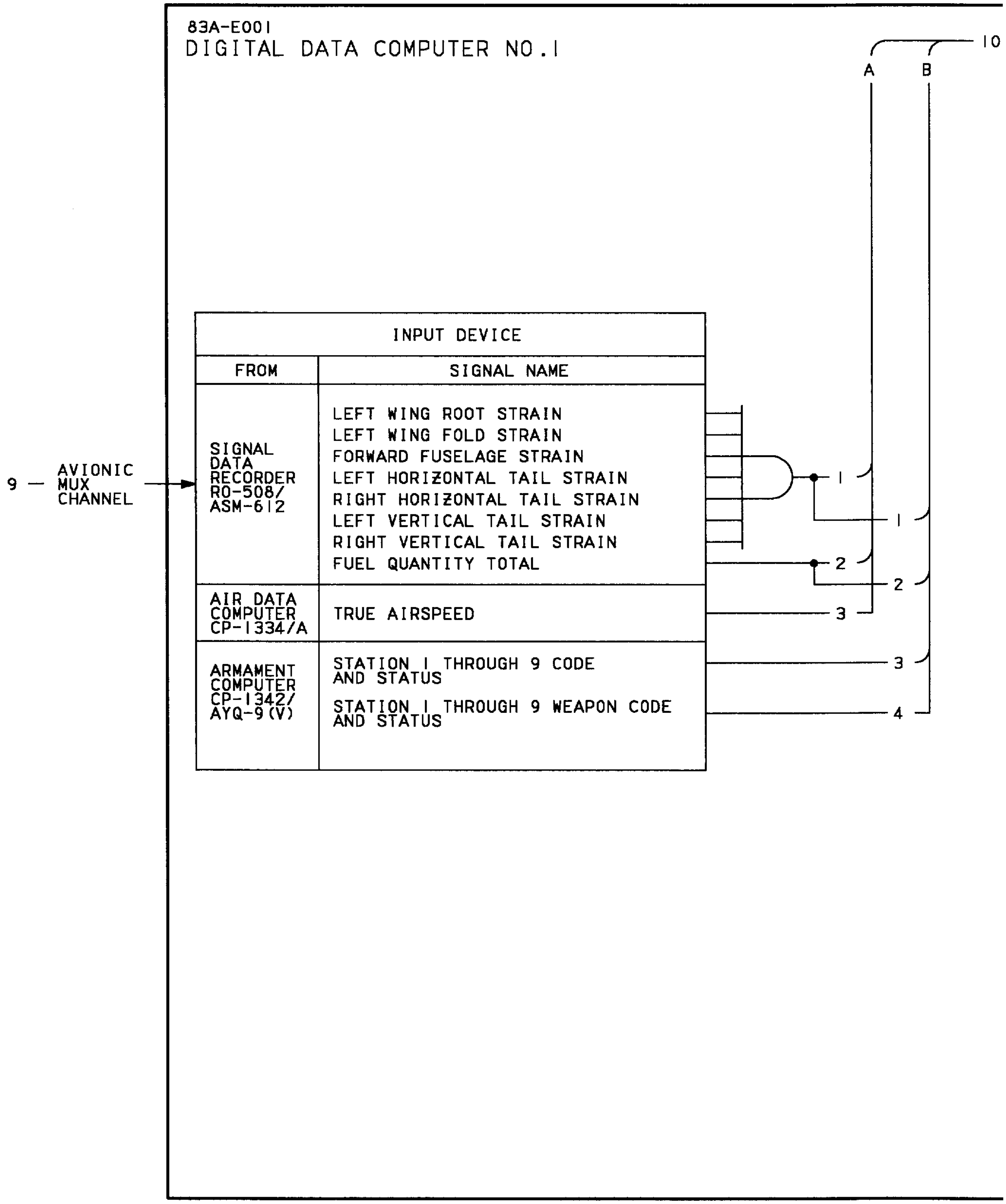
18AC-580-10-(21-4)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 4)



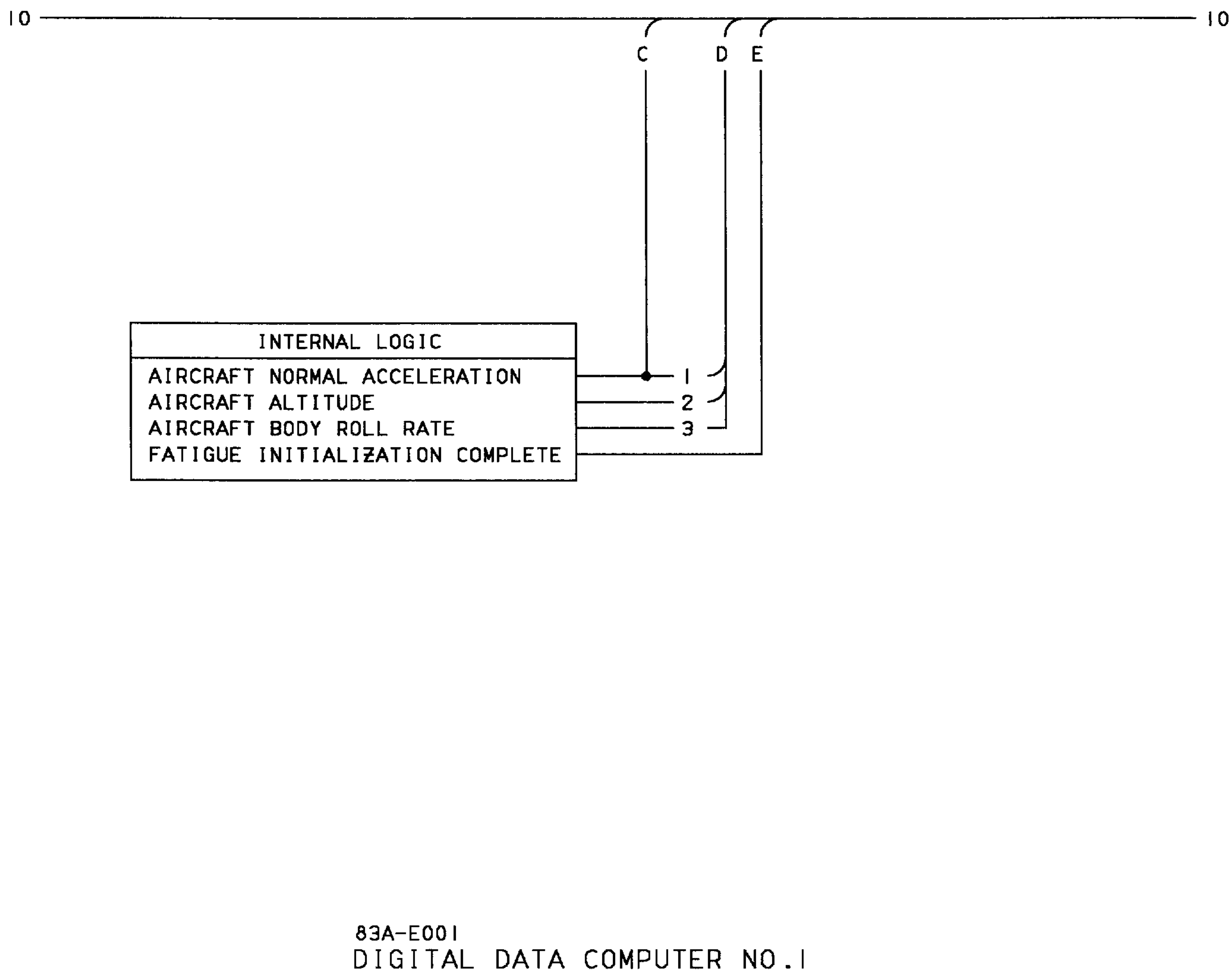
18AC-580-10-(21-5)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 5)



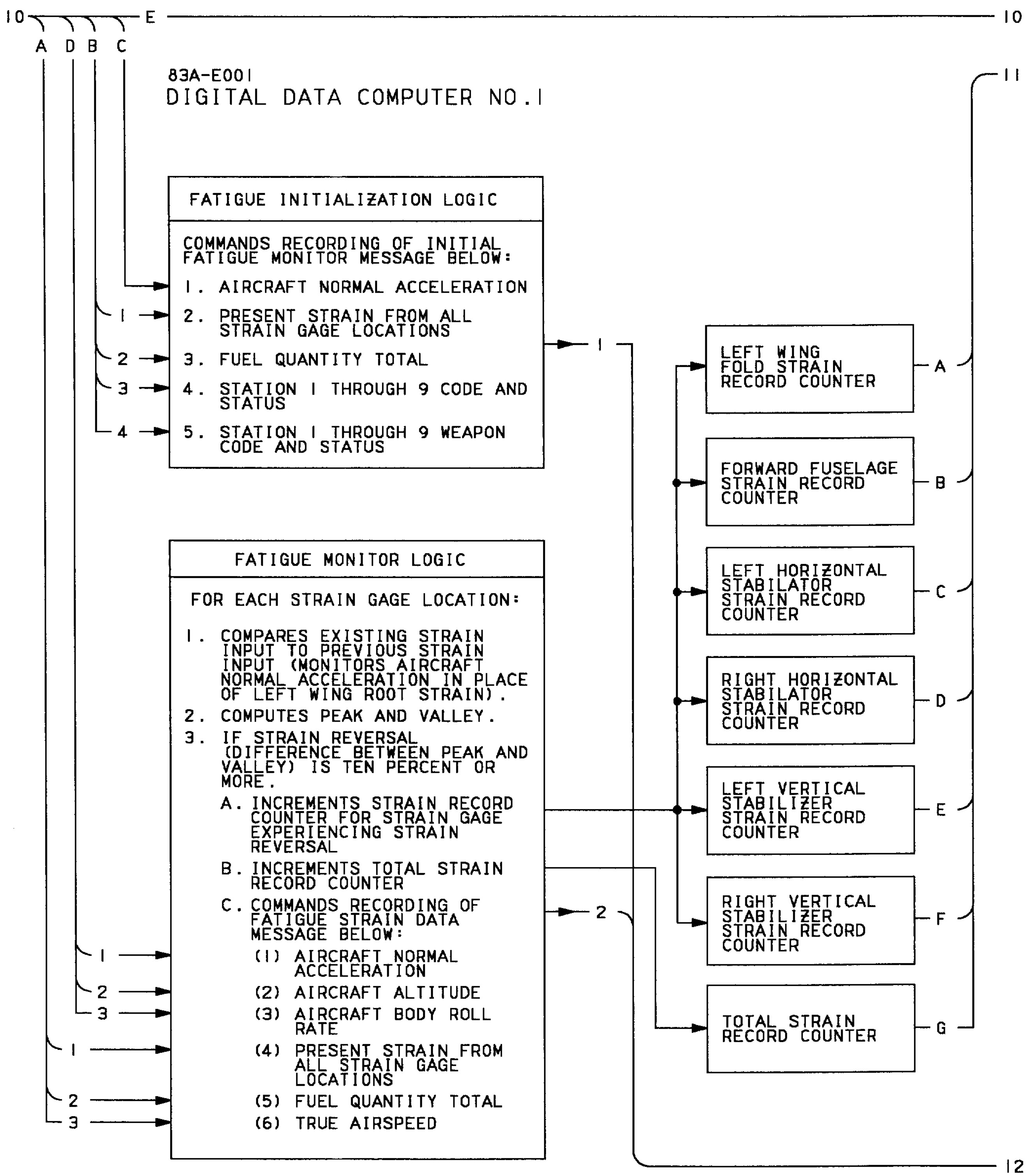
18AC-580-10-(21-6)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 6)



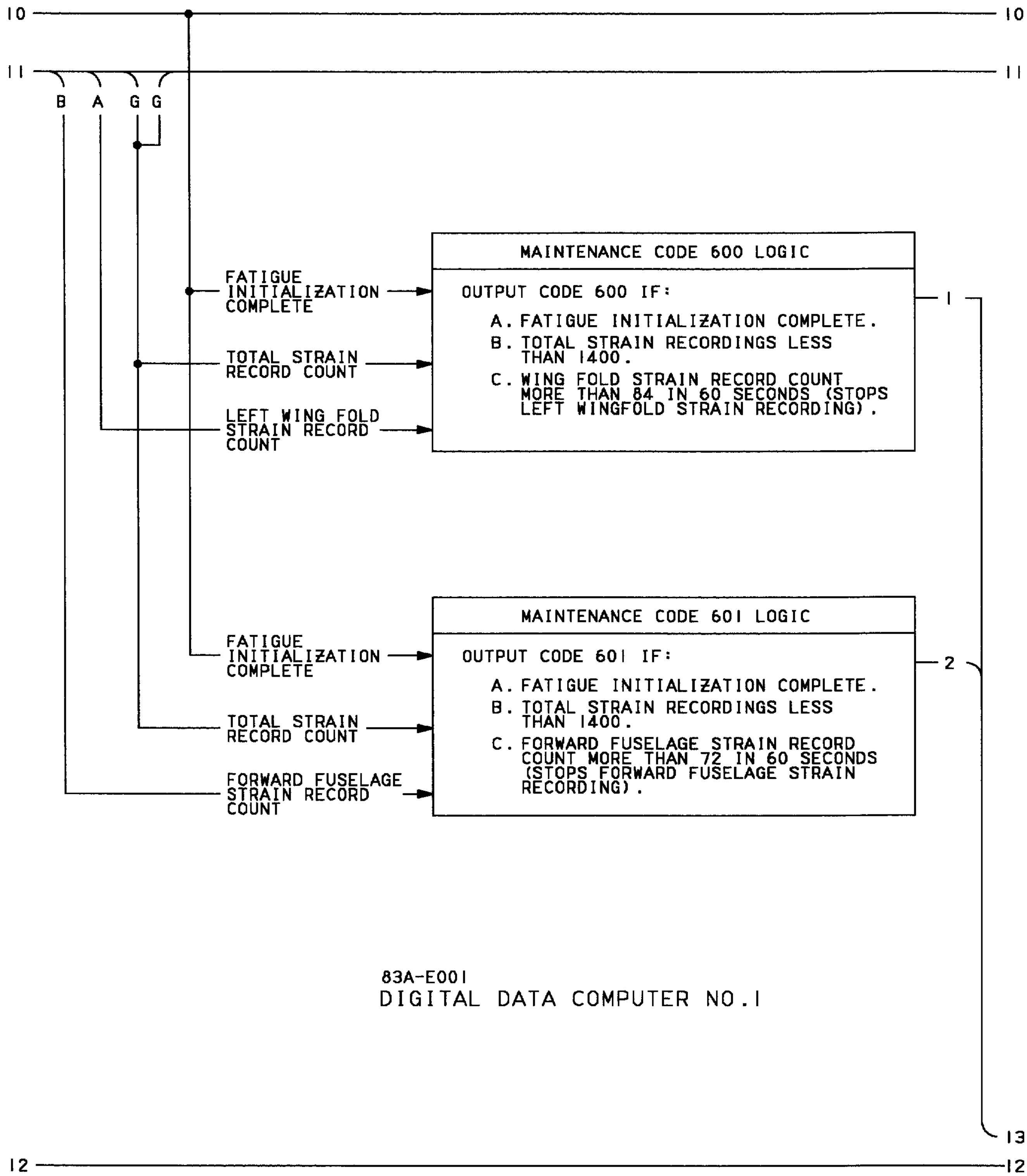
18AC-580-10-(21-7)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 7)



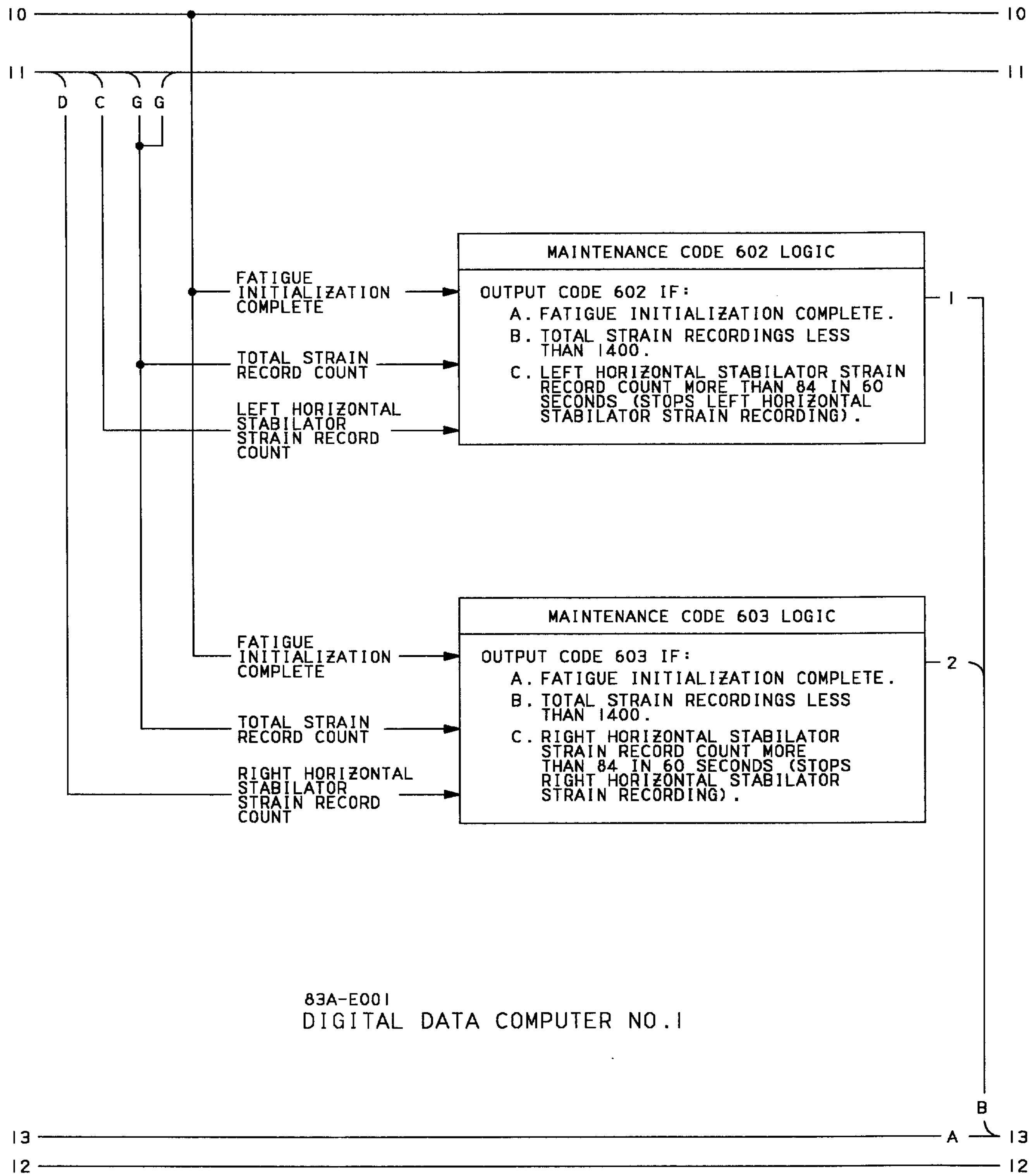
18AC-580-10-(21-8)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 8)



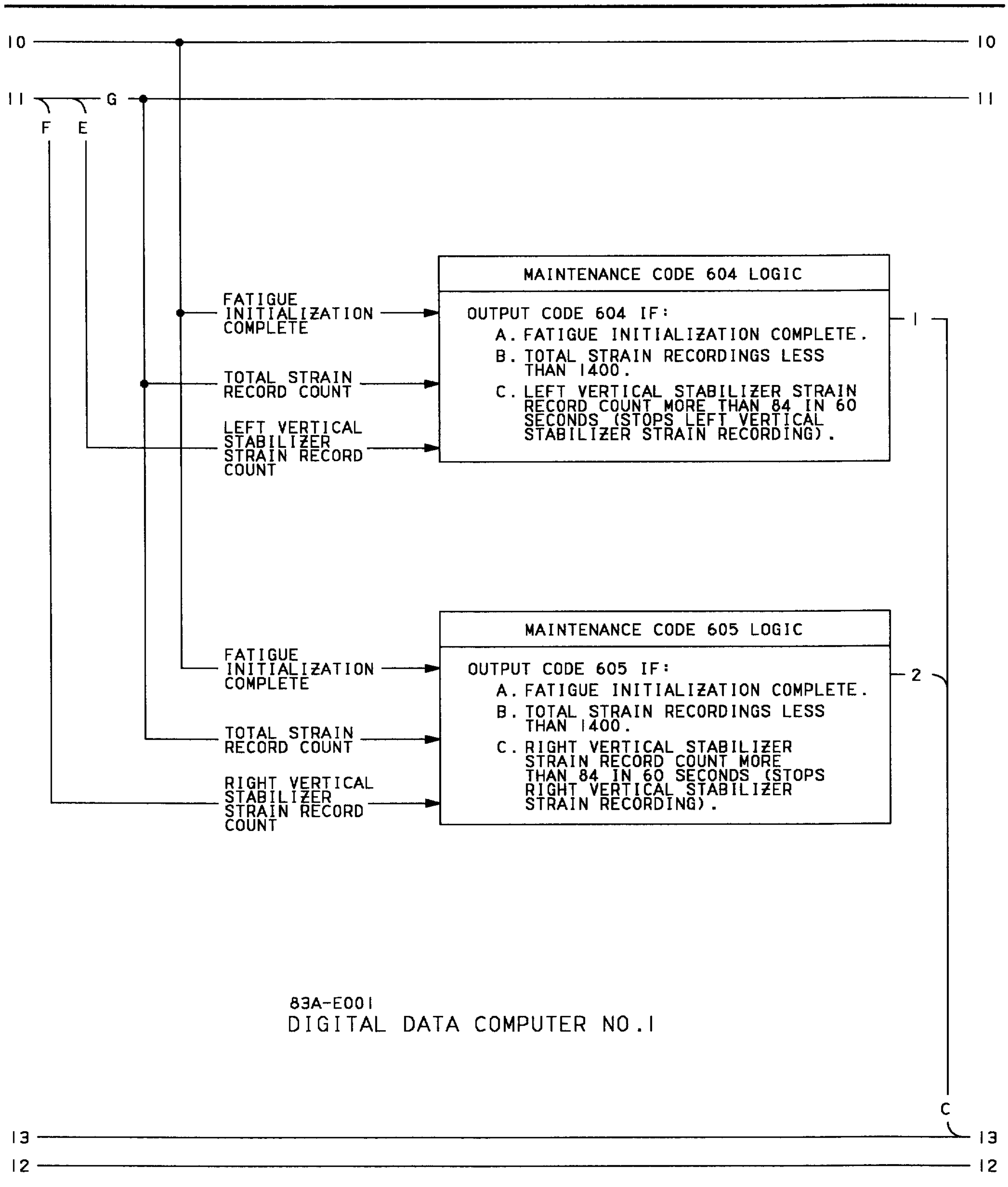
18AC-580-10-(21-9)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 9)



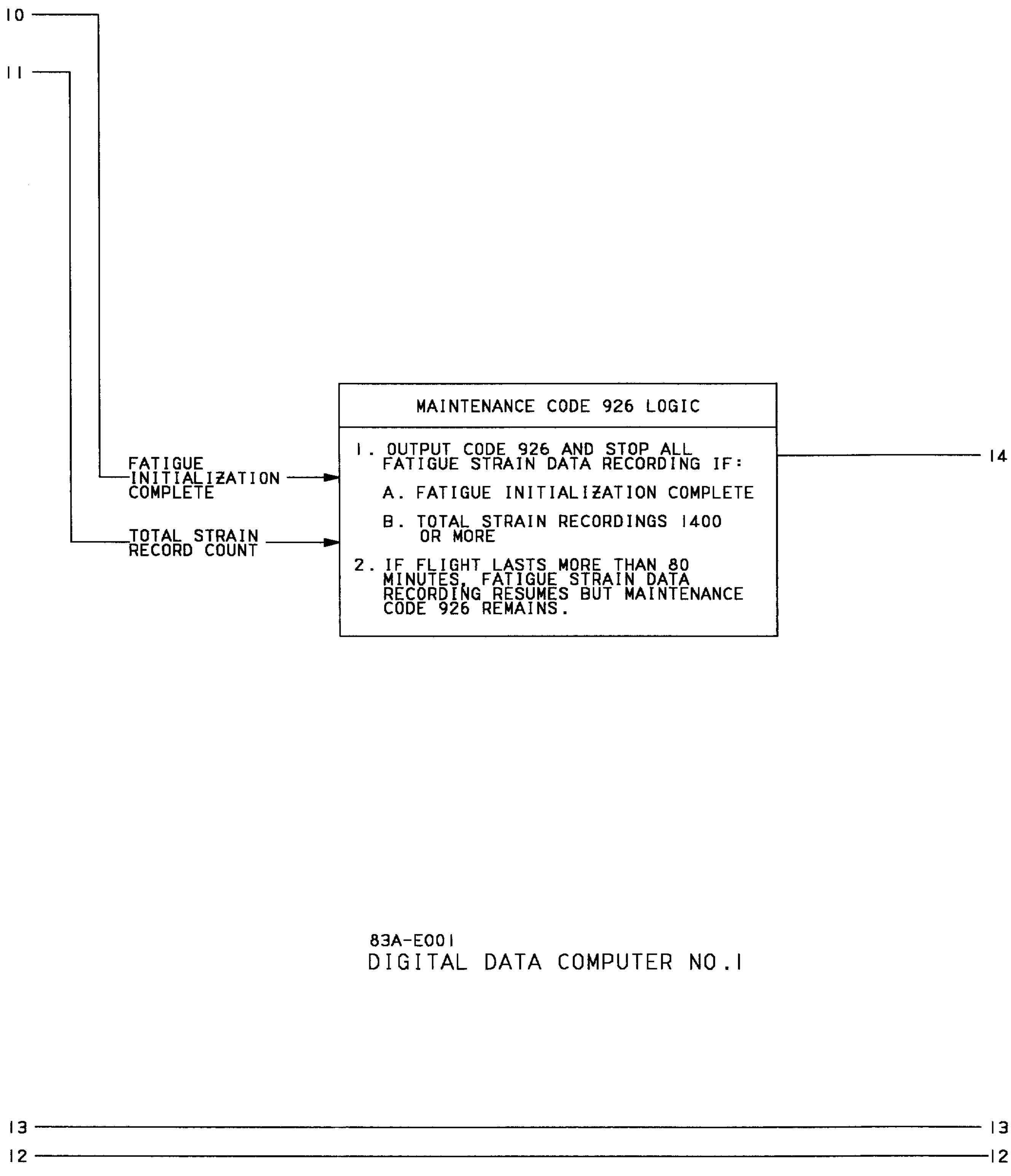
18AC-580-10-(21-10)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 10)



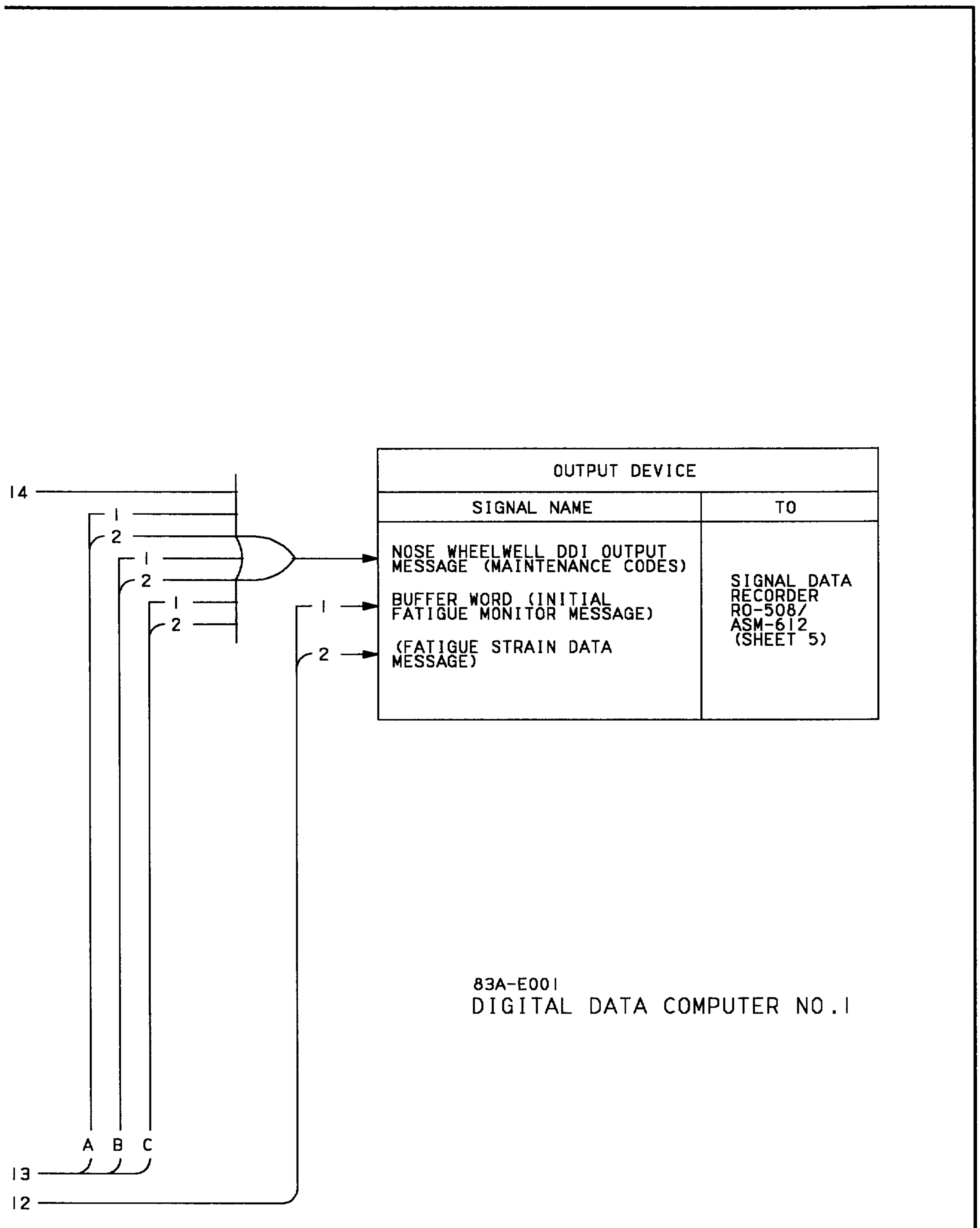
18AC-580-10-(21-11)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 11)



18AC-580-10-(21-12)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 12)



18AC-580-10-(21-13)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 13)

LEGEND

(1) SIGNAL DATA RECORDING SET AN/ASM-612 BUILT-IN TEST SIMPLIFIED SCHEMATIC, WP016 00.

(2) SIMPLIFIED POWER SCHEMATIC, WP006 00.

(3) FUEL SYSTEM INTERFACE SIMPLIFIED SCHEMATIC, WP011 00.

(4) RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

18AC-580-10-(21-14)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 14)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - FATIGUE STRAIN DATA

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 210

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

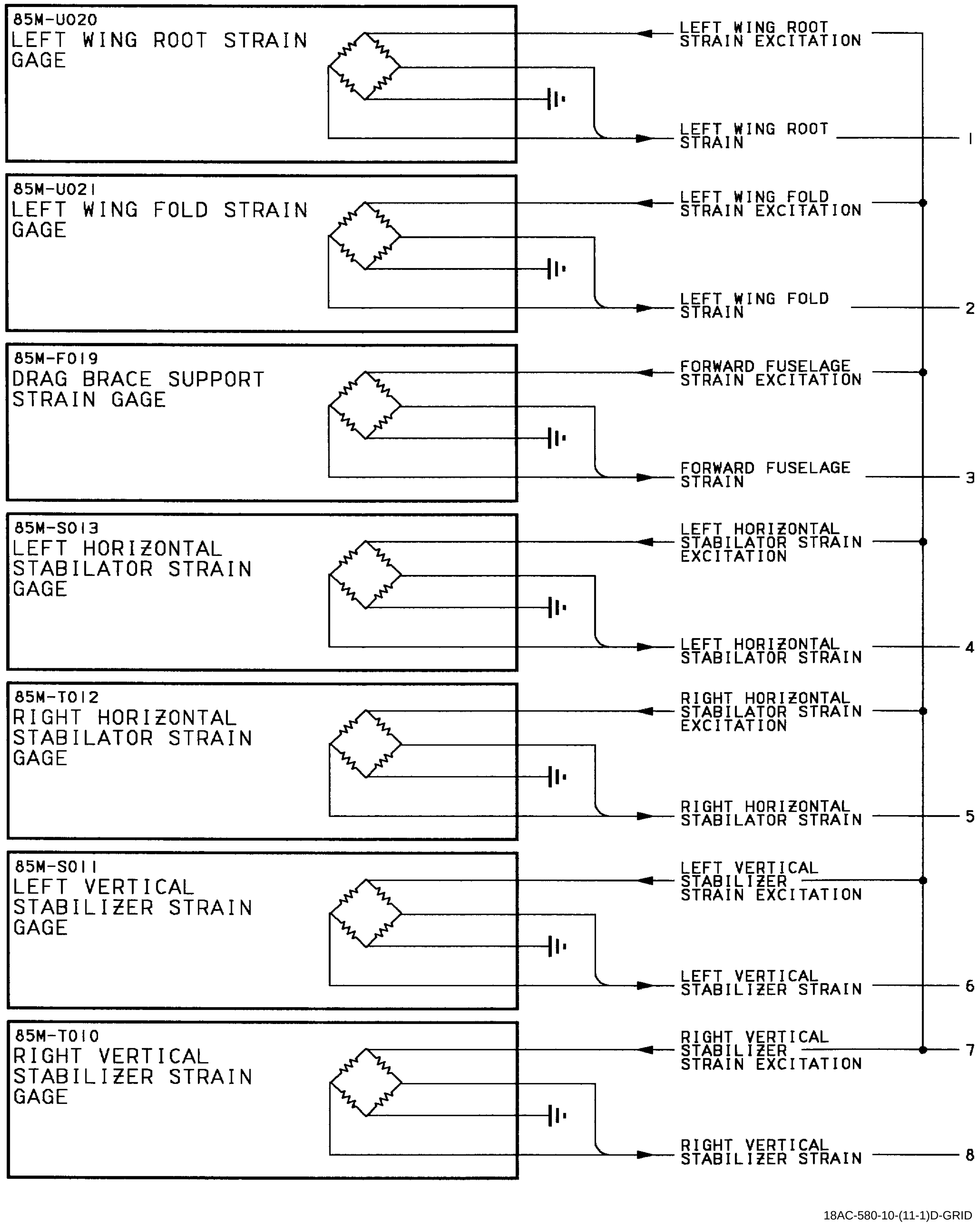
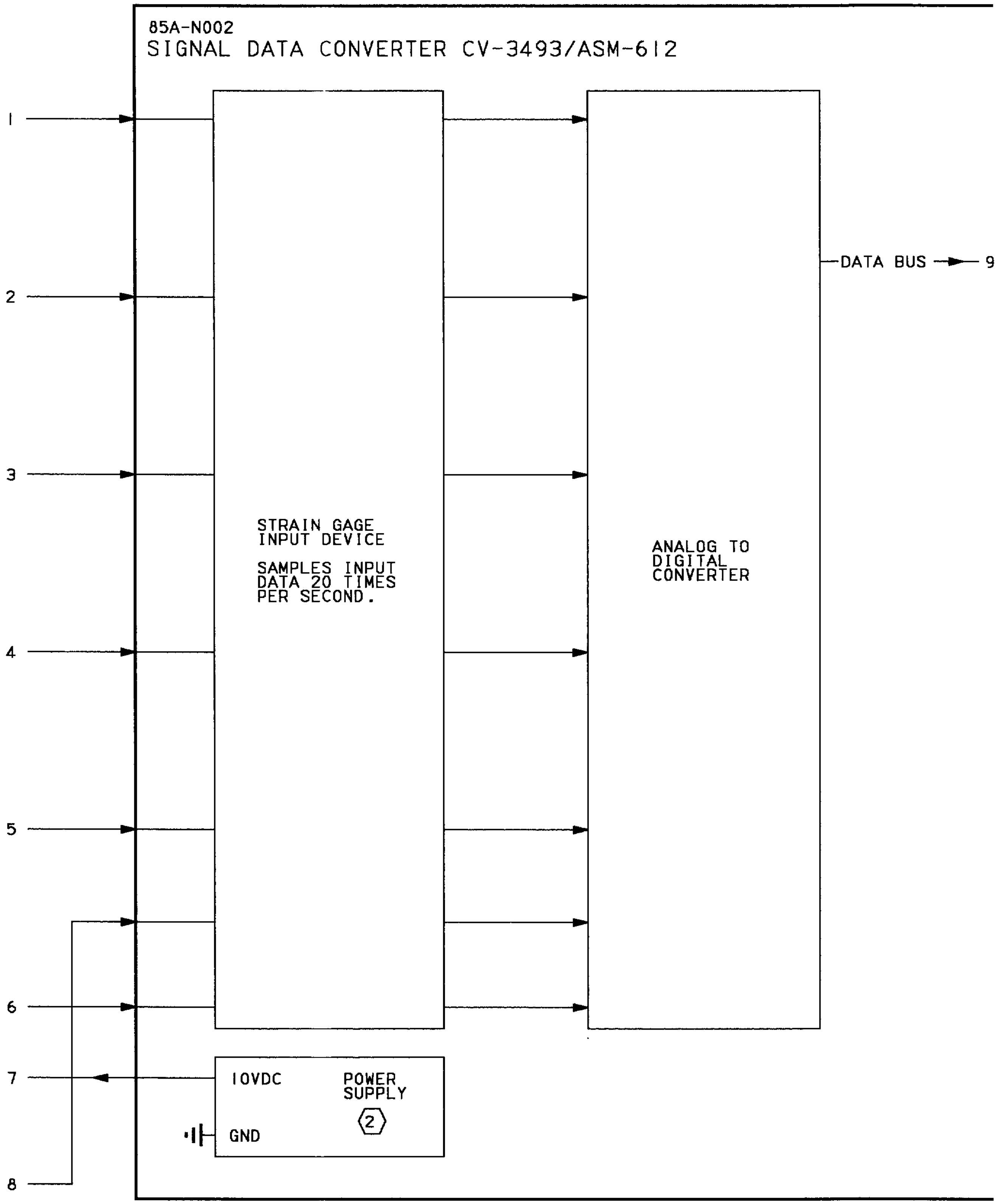
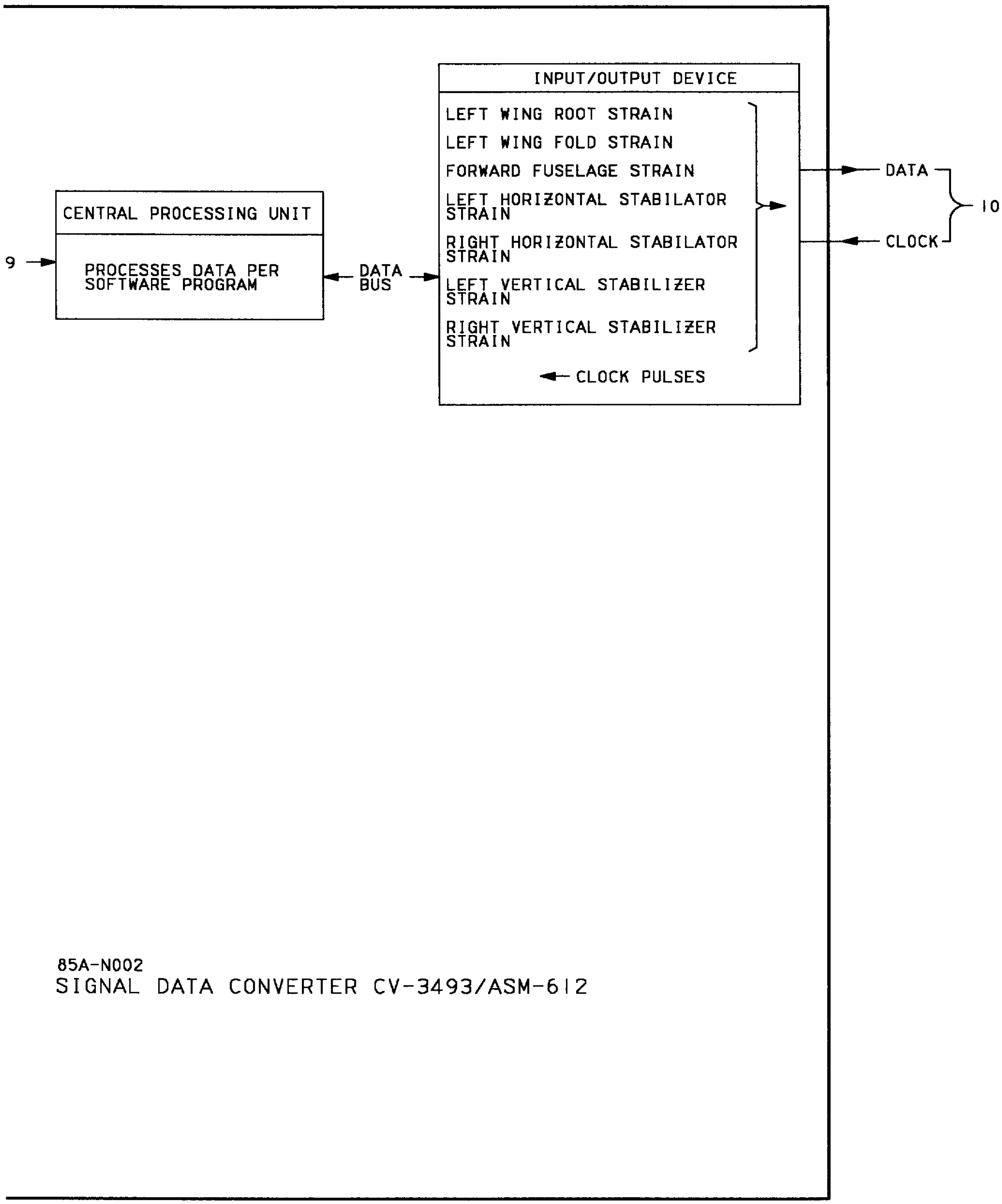


Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 1)



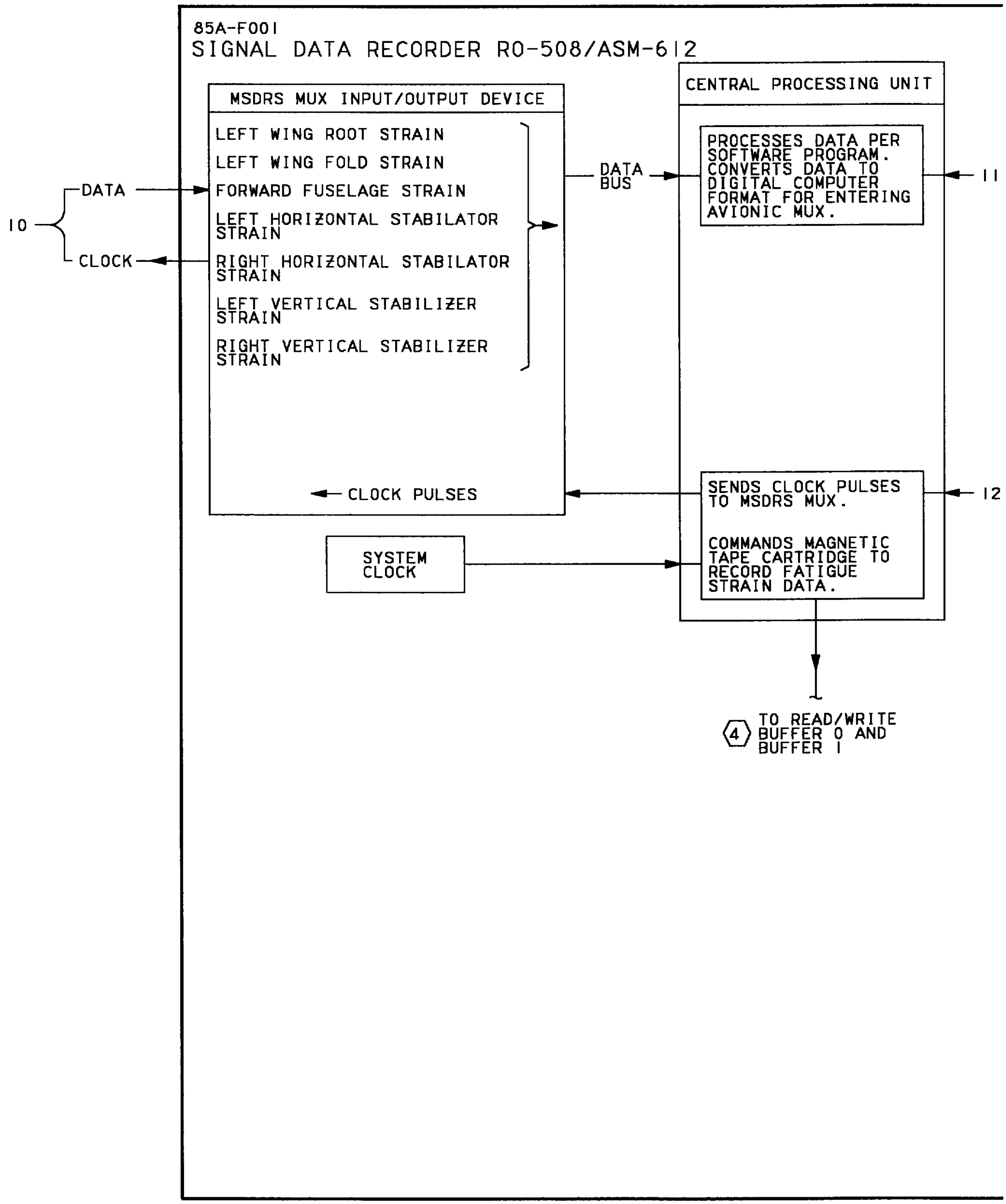
18AC-580-10-(11-2)D-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 2)



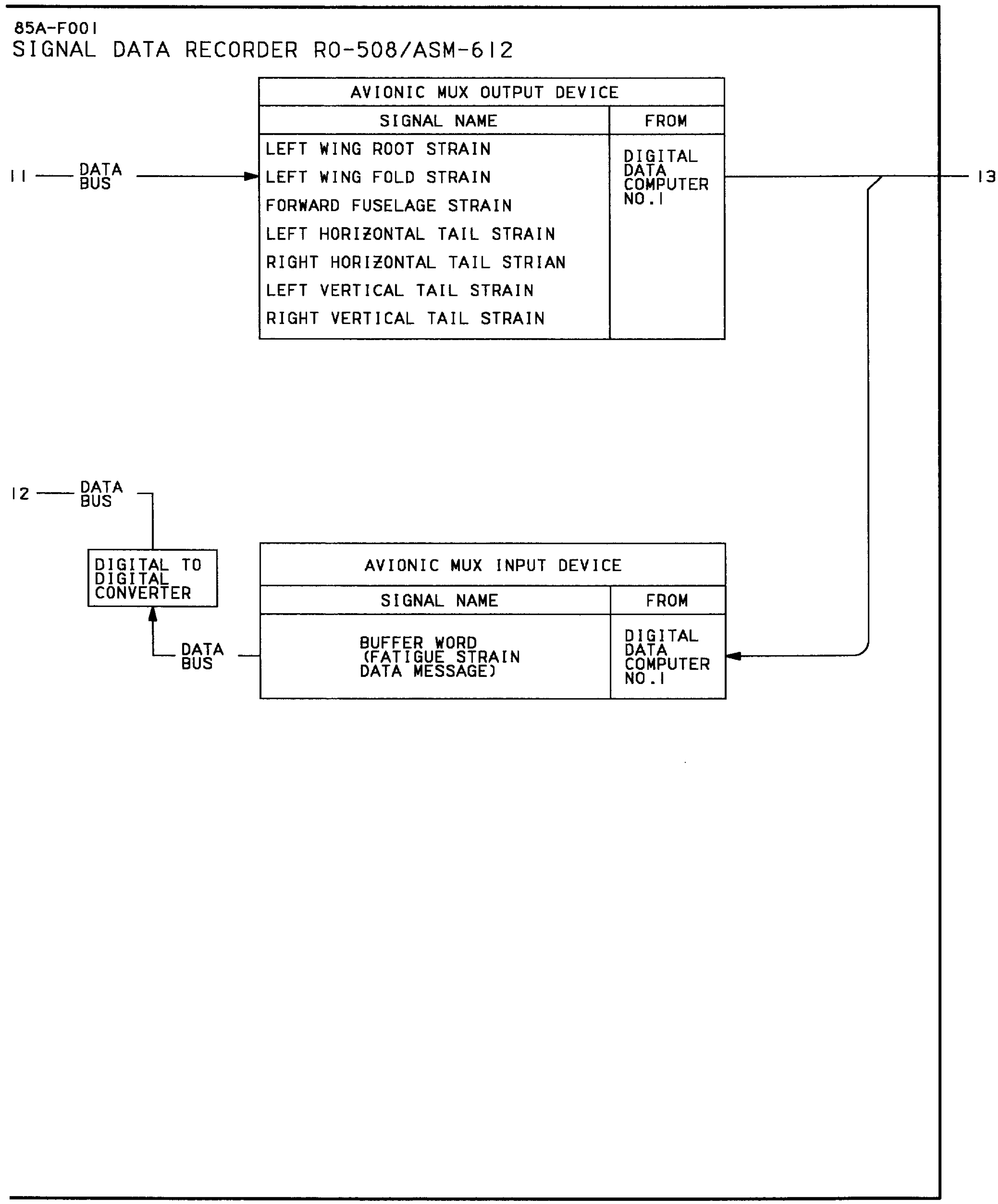
18AC-580-10-(11-3)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 3)



18AC-580-10-(11-4)B-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 4)



18AC-580-10-(11-5)A-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 5)

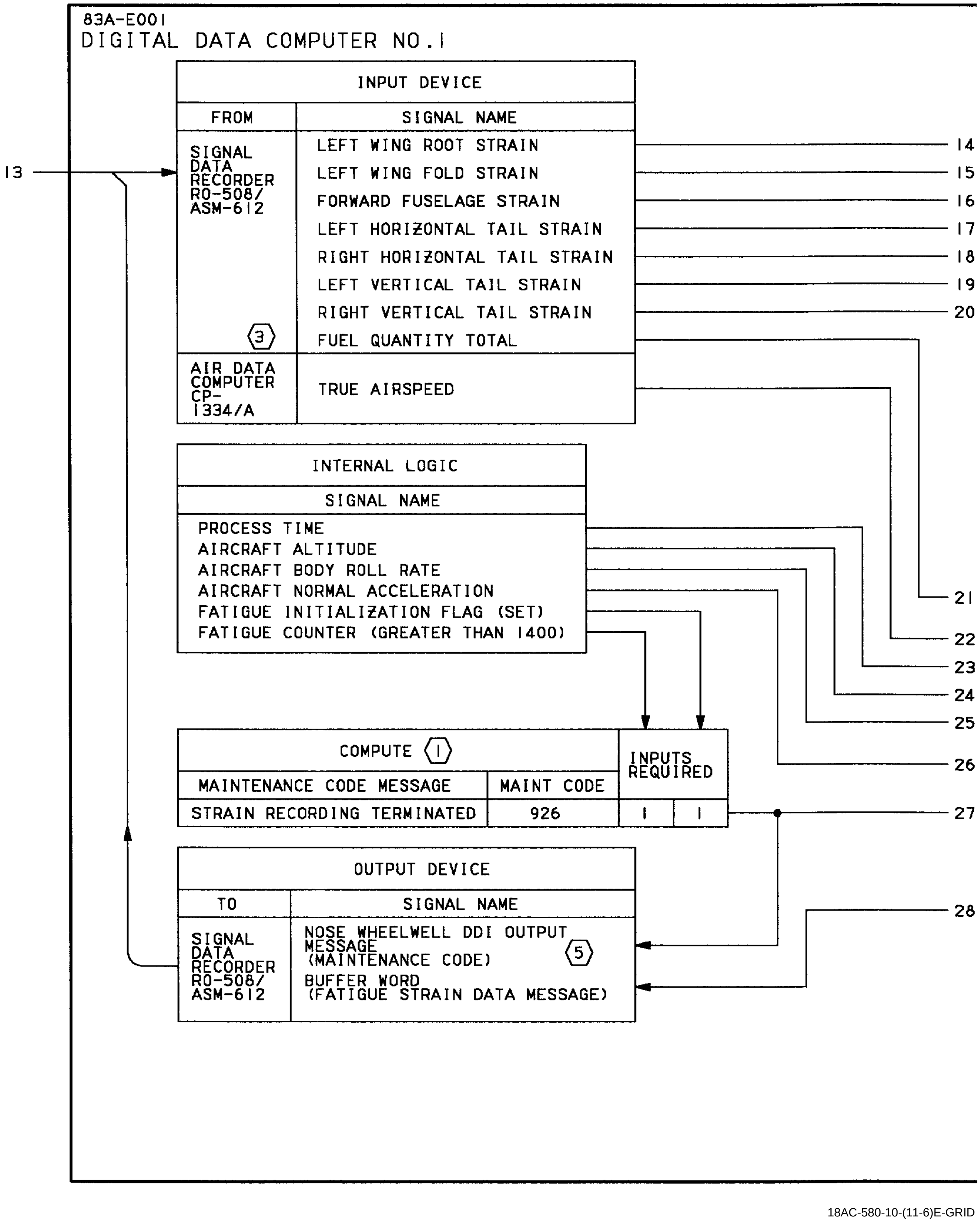
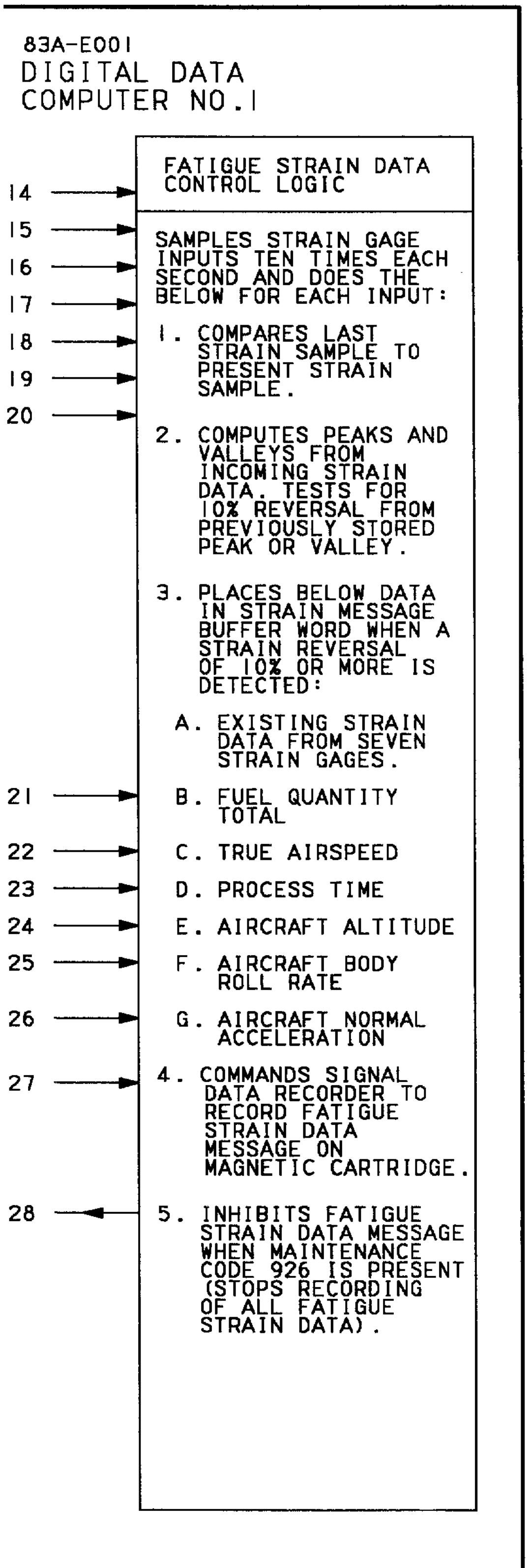


Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 6)



LEGEND

1 EXPLANATION OF MATRIX

A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.

B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUTS.

C. SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.

D. INTERPRET MATRIX TABLE AS INDICATED:

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.

(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.

(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

2 SIMPLIFIED POWER SCHEMATIC, WP006 00.

3 FUEL SYSTEM INTERFACE SIMPLIFIED SCHEMATIC, WP011 00.

4 RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

5 SIGNAL DATA RECORDING SET AN/ASM-612 BUILT-IN TEST SIMPLIFIED SCHEMATIC, WP016 00.

18AC-580-10-(11-7)E-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 7)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - FATIGUE STRAIN DATA

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 85A+ AND UP

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

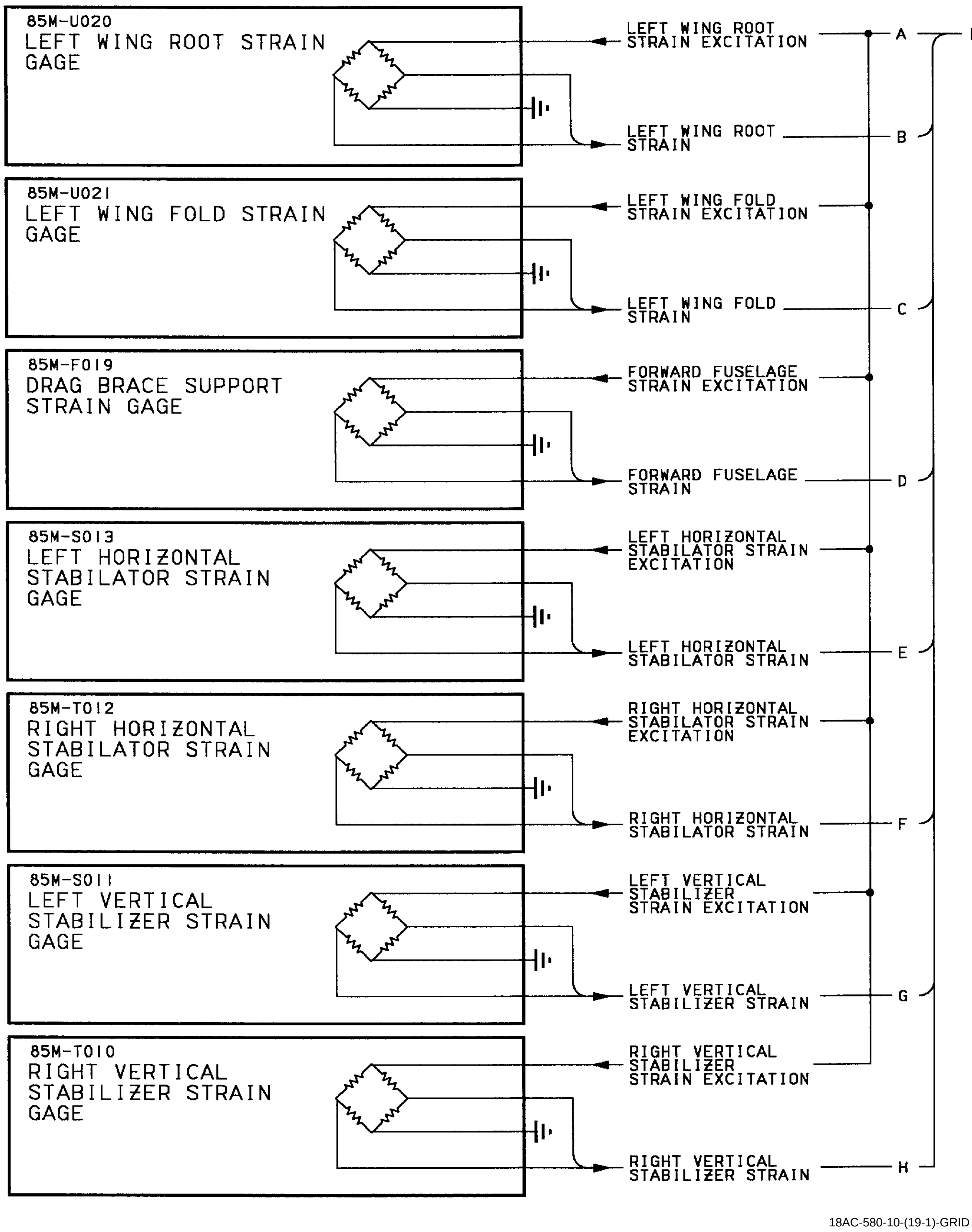


Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 1)

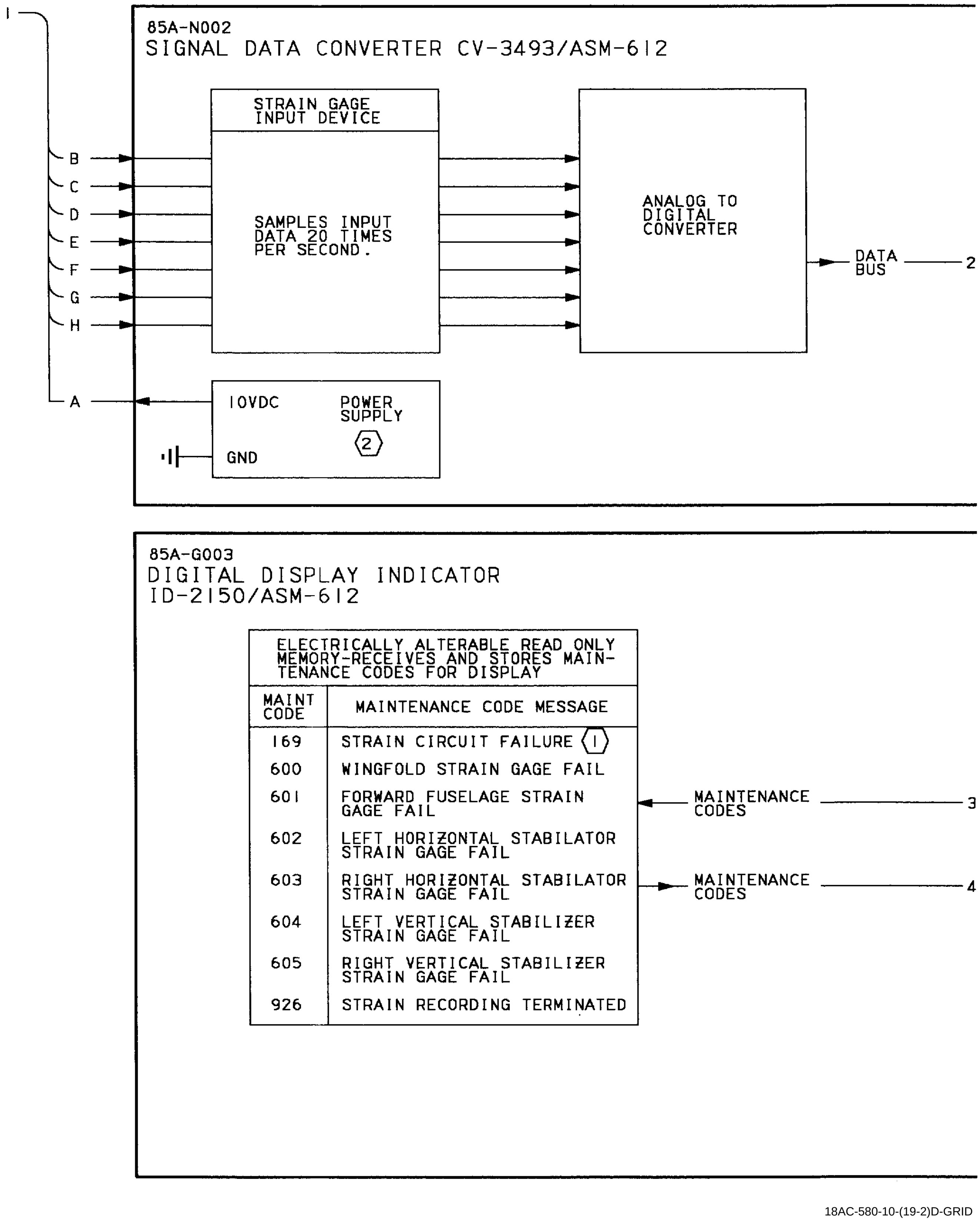
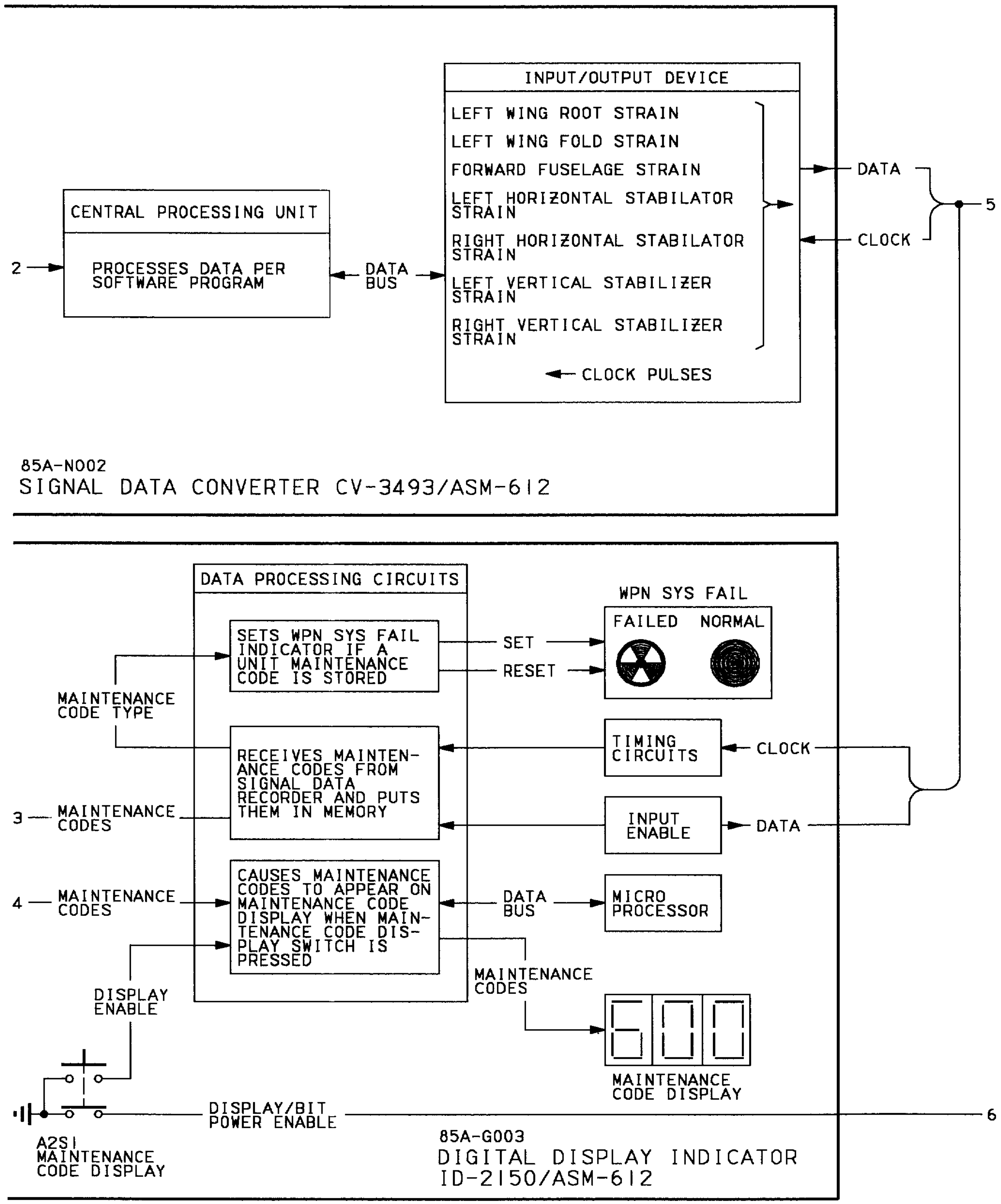
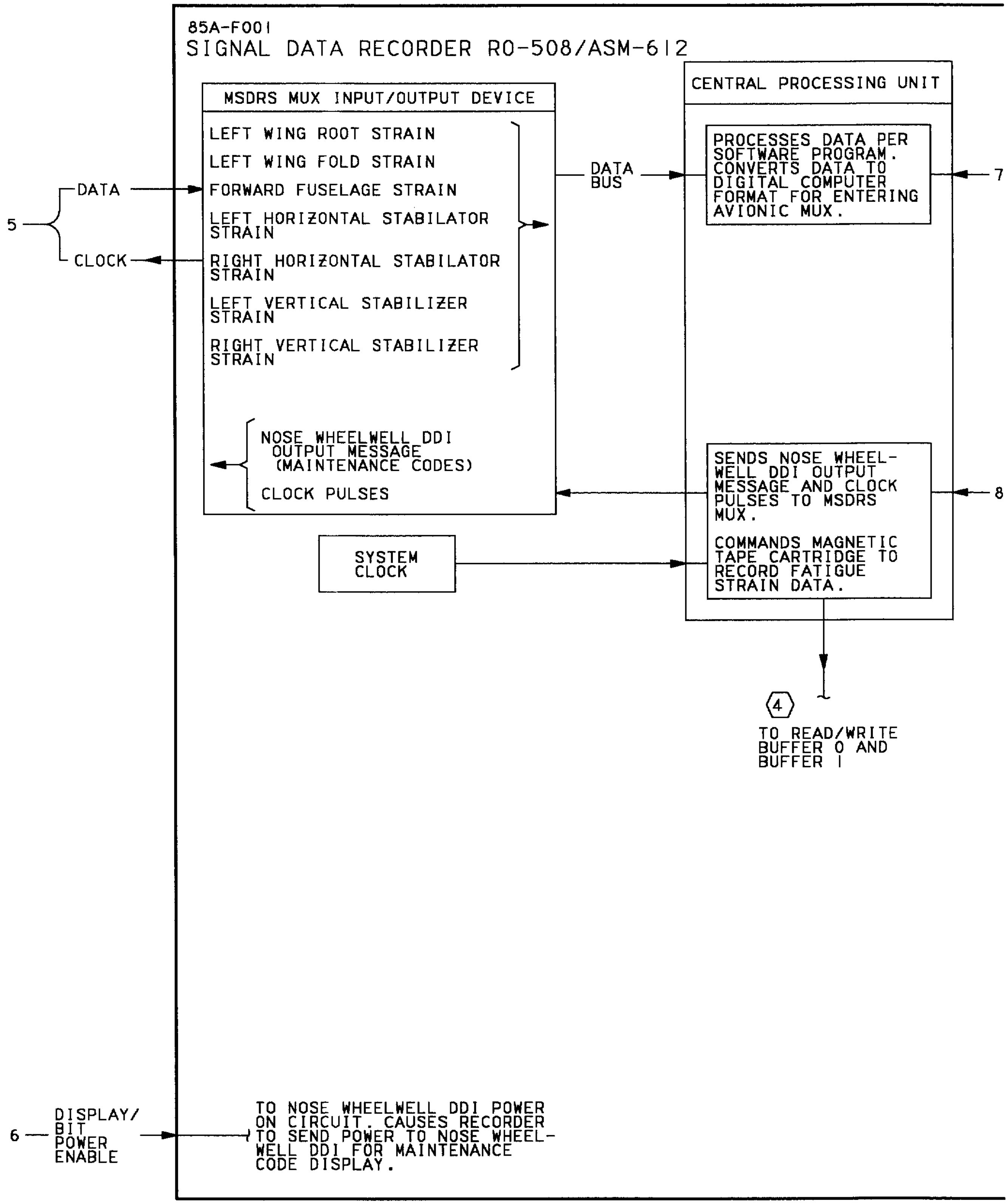


Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 2)



18AC-580-10-(19-3)B-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 3)



18AC-580-10-(19-4)-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 4)

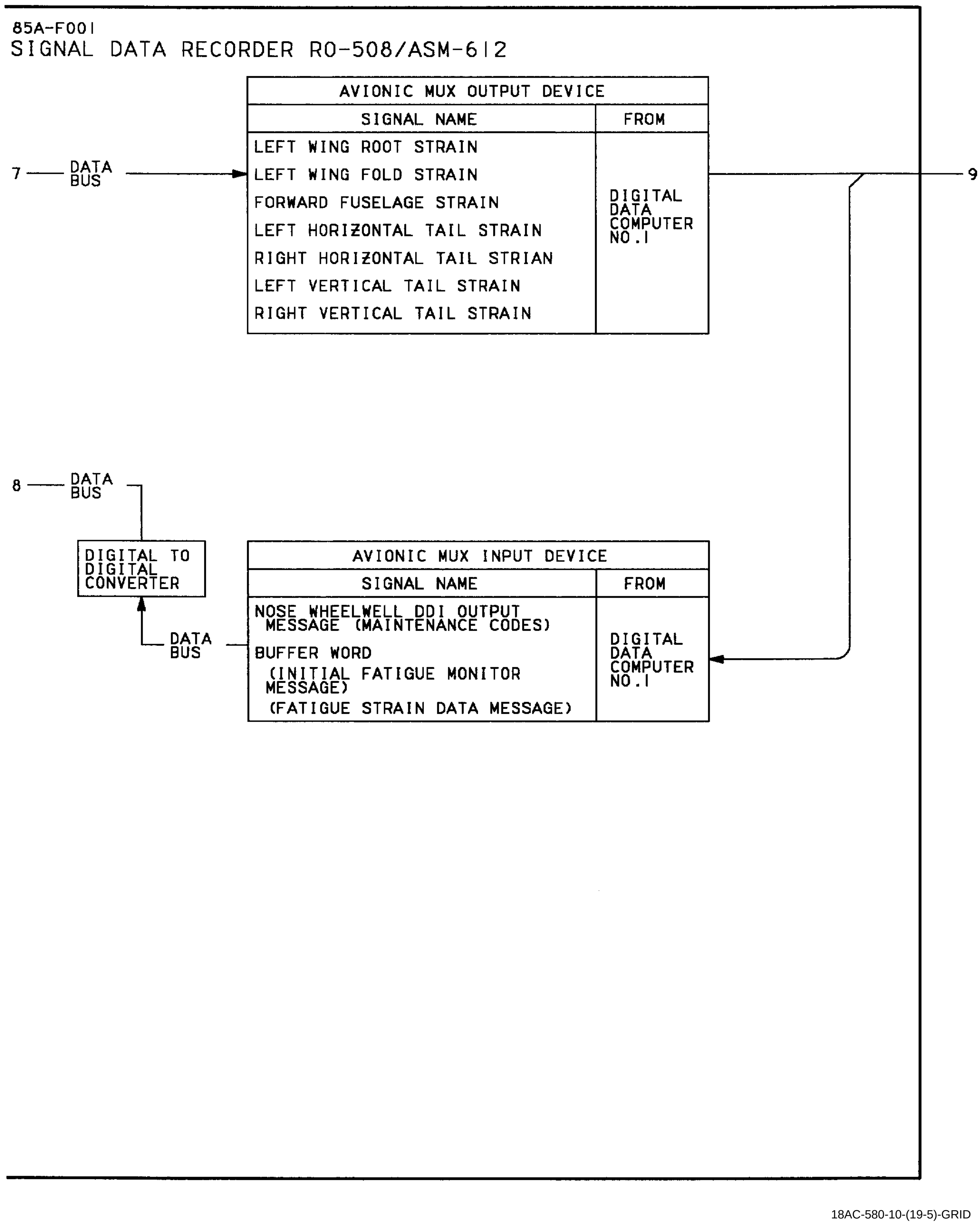
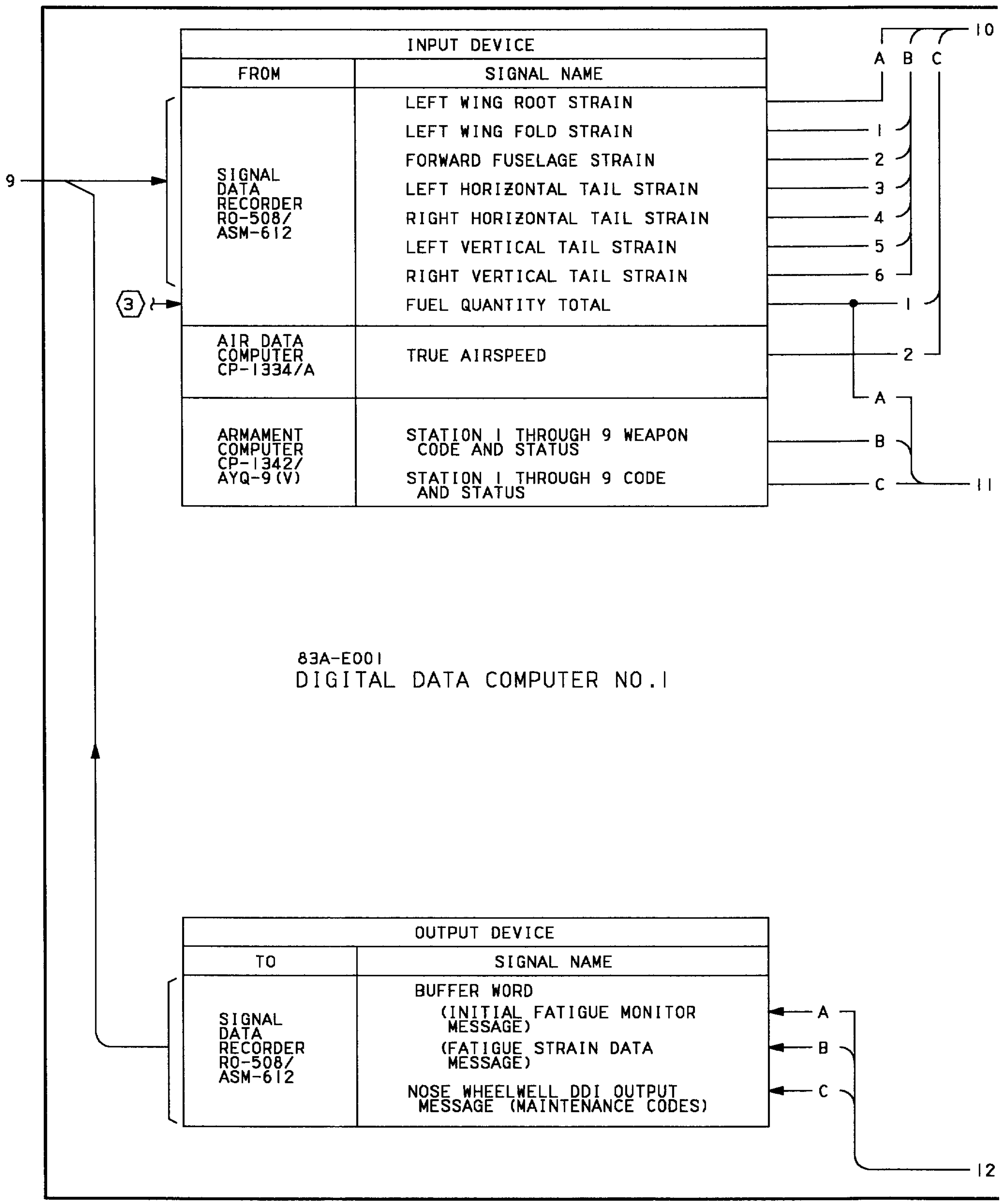
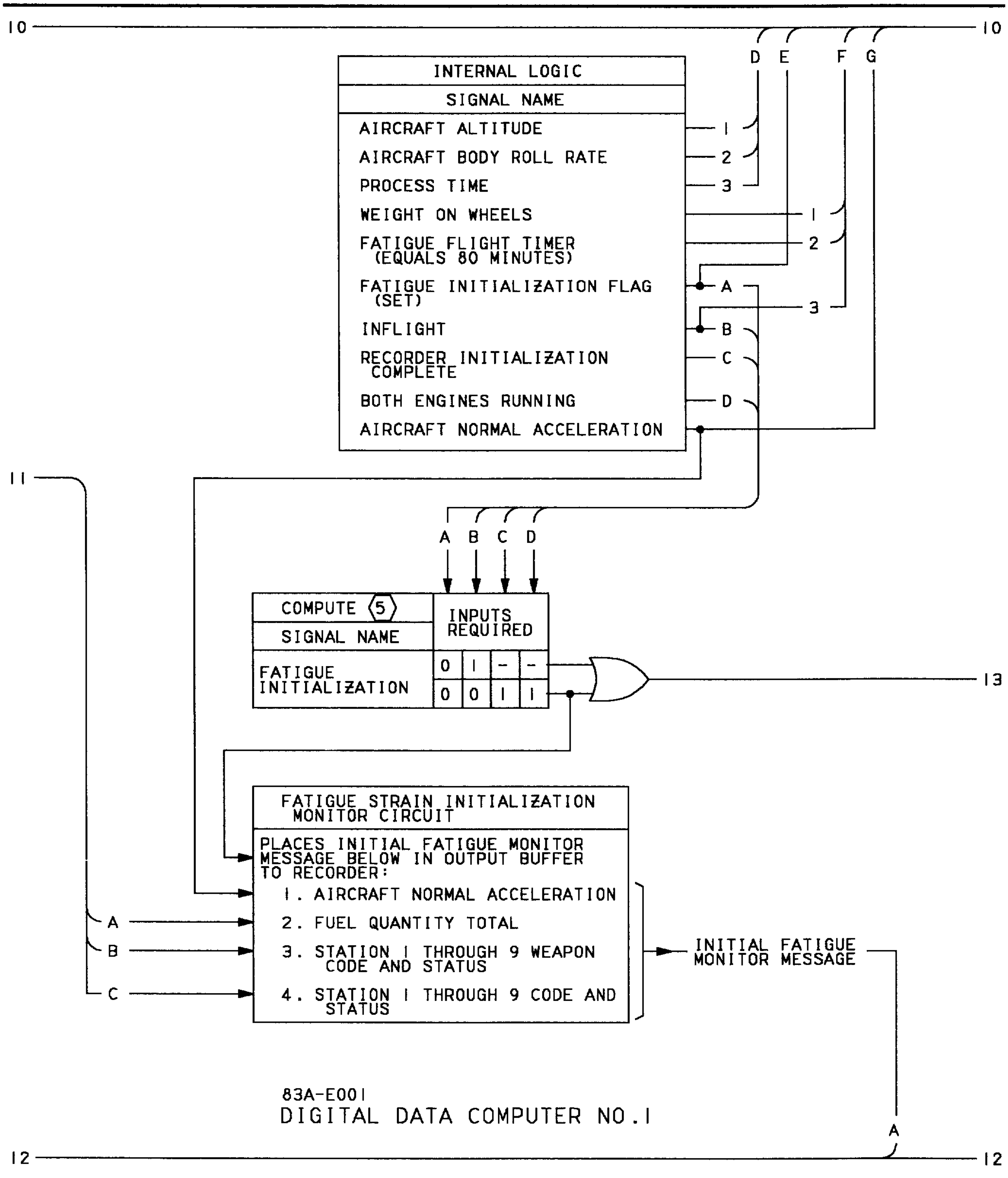


Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 5)



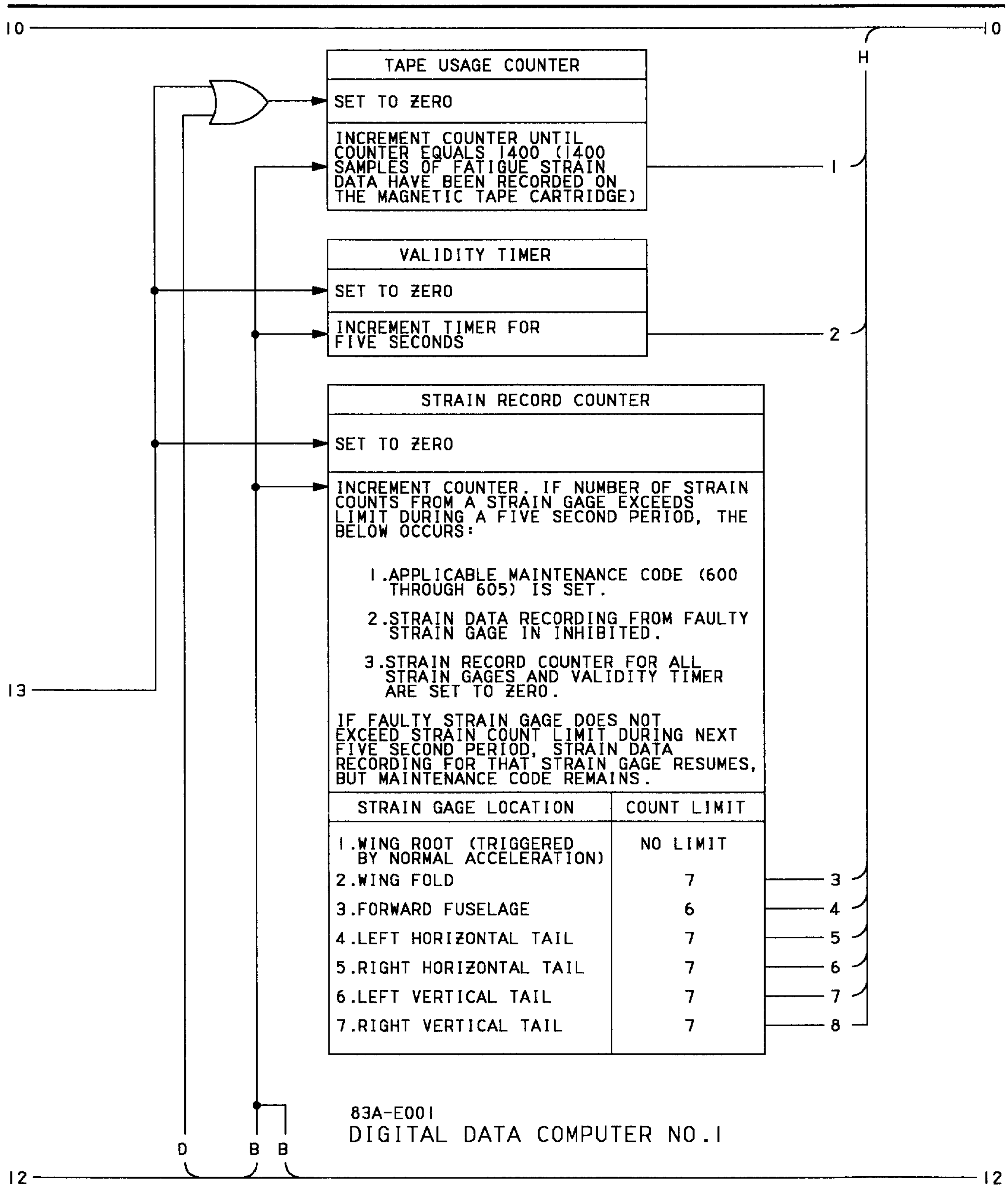
18AC-580-10-(19-6)C-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 6)



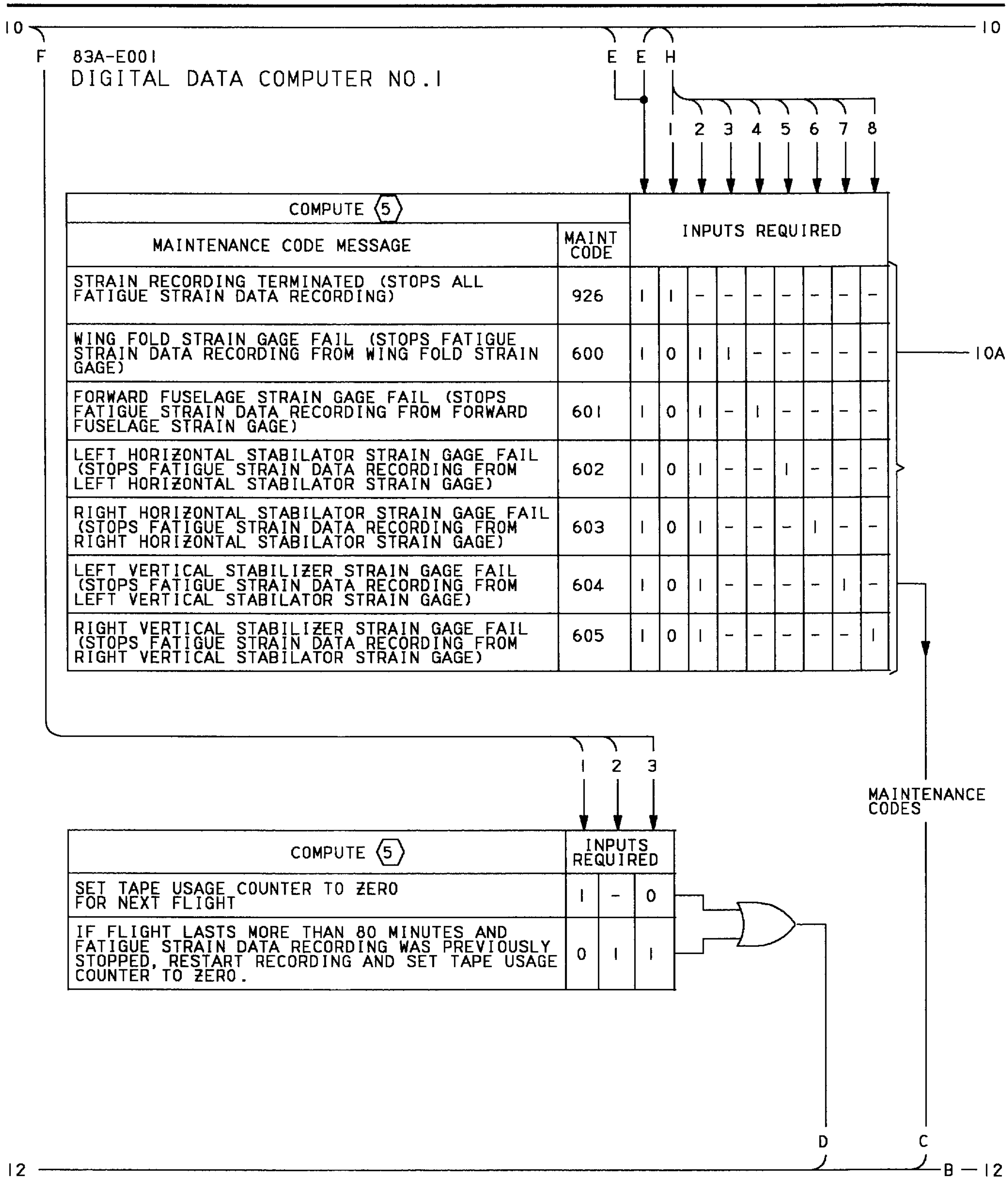
18AC-580-10-(19-7)C-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 7)



18AC-580-10-(19-8)C-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 8)

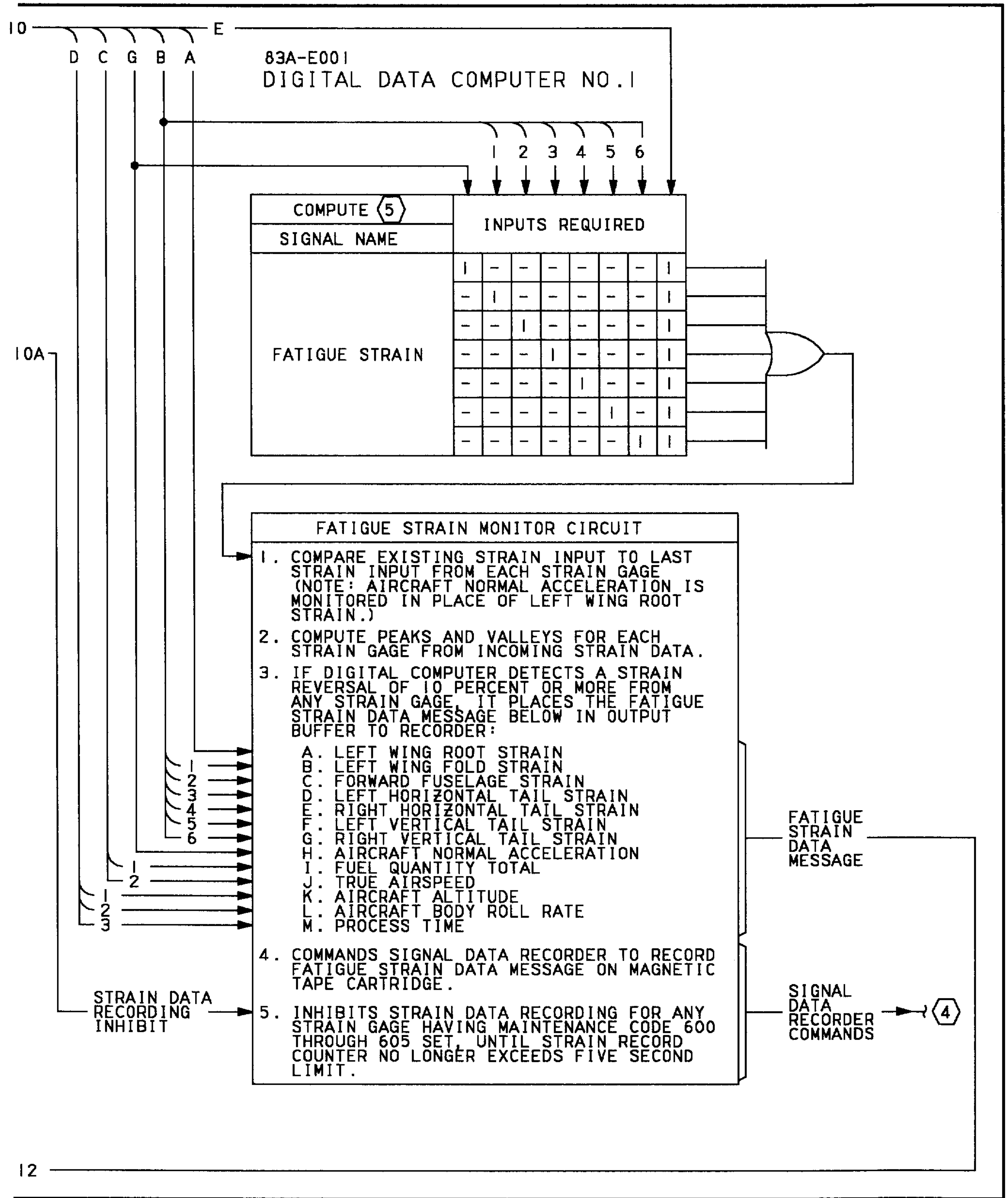


COMPUTE ⟨5⟩		INPUTS REQUIRED								
MAINTENANCE CODE MESSAGE	MAINT CODE									
STRAIN RECORDING TERMINATED (STOPS ALL FATIGUE STRAIN DATA RECORDING)	926	1	1	–	–	–	–	–	–	–
WING FOLD STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM WING FOLD STRAIN GAGE)	600	1	0	1	1	–	–	–	–	–
FORWARD FUSELAGE STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM FORWARD FUSELAGE STRAIN GAGE)	601	1	0	1	–	1	–	–	–	–
LEFT HORIZONTAL STABILATOR STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM LEFT HORIZONTAL STABILATOR STRAIN GAGE)	602	1	0	1	–	–	1	–	–	–
RIGHT HORIZONTAL STABILATOR STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM RIGHT HORIZONTAL STABILATOR STRAIN GAGE)	603	1	0	1	–	–	–	1	–	–
LEFT VERTICAL STABILIZER STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM LEFT VERTICAL STABILATOR STRAIN GAGE)	604	1	0	1	–	–	–	–	1	–
RIGHT VERTICAL STABILIZER STRAIN GAGE FAIL (STOPS FATIGUE STRAIN DATA RECORDING FROM RIGHT VERTICAL STABILATOR STRAIN GAGE)	605	1	0	1	–	–	–	–	–	1

COMPUTE ⟨5⟩	INPUTS REQUIRED		
SET TAPE USAGE COUNTER TO ZERO FOR NEXT FLIGHT	1	–	0
IF FLIGHT LASTS MORE THAN 80 MINUTES AND FATIGUE STRAIN DATA RECORDING WAS PREVIOUSLY STOPPED, RESTART RECORDING AND SET TAPE USAGE COUNTER TO ZERO.	0	1	1

18AC-580-10-(19-9)C-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 9)



18AC-580-10-(19-10)C-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 10)

LEGEND

1. SIGNAL DATA RECORDING SET AN/ASM-612 BUILT-IN TEST SIMPLIFIED SCHEMATIC, WP016 00.
2. SIMPLIFIED POWER SCHEMATIC, WP006 00.
3. FUEL SYSTEM INTERFACE SIMPLIFIED SCHEMATIC, WP011 00.
4. RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.
5. EXPLANATION OF MATRIX
   A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.
   B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.
   C. SIGNAL OUTPUT IS READ HORIZONTALLY, EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.
   D. INTERPRET MATRIX TABLE AS INDICATED:
      (1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.
      (2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.
      (3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

18AC-580-10-(19-11)D-GRID

Figure 1. Fatigue Strain Data Simplified Schematic (Sheet 11)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

OPERATION - DIGITAL DISPLAY INDICATOR ID-2150/ASM-612 INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP013 00, dated 15 April 1987.

Reference Material

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 90	-	Incorporation of GFE Battery Relay Control Unit (ECP MDA-F/A-18-00166R1)	1 Aug 88	ECP Coverage only

1. INTRODUCTION.

2. The maintenance status display and recording system (MSDRS) operations are:

a. power requirements (WP005 00).

b. 100 kHz MSDRS mux bus (WP005 00).

c. data acquisition (WP005 00).

d. data processing (WP005 00).

e. Digital Display Indicator ID-2150/ASM-612 interface.

f. built-in test (WP015 00).

3. DIGITAL DISPLAY INDICATOR ID-2150/ASM-612 INTERFACE.

4. The operations for Digital Display Indicator ID-2150/ASM-612 (nose wheelwell DDI) are:

a. power up sequence.

b. fluids test.

c. maintenance code display.

d. built-in test/reset.

5. **POWER UP SEQUENCE.** See WP006 00 and WP014 00. The nose wheelwell DDI power supply receives 28vdc maintenance bus power from Signal Data Recorder RO-508/ASM-612 (recorder) energized relay A13K2. Relay A13K2 receives 28vdc as below:

a. On 161353 THRU 161528 BEFORE F/A-18 AFC 90, from no. 8 circuit breaker/relay panel assembly MSDRS circuit breaker 85CBC004.

b. On 161702 THRU 163118 BEFORE F/A-18 AFC 90, from no. 8 circuit breaker/relay panel assembly MSDRS circuit breaker 85CBC004 through deenergized relay 83K-C014.

c. On 163119 AND UP; ALSO 161353 THRU 163118 AFTER F/A-18 AFC 90, from no. 8 circuit breaker/relay panel assembly MSDRS circuit breaker 85CBC004 through no. 7 circuit breaker/relay panel assembly energized relay 1K-C154 and no. 8 circuit breaker/relay panel assembly deenergized relay 83K-C014.

d. If external power is not applied or generators are not operating, to manually operate the nose wheelwell DDI the nose wheelwell MMP ENABLE/BRCU switch must be momentarily set to RESET. This causes the battery relay control unit to output a ground for 4.5 to 5.5 minutes to energize relay 1K-C154.

e. When 4.5 to 5.5 minutes have elapsed, a timer in the battery relay control unit times out and removes the ground output causing relay 1K-C154 to deenergize. When relay 1K-C154 deenergizes, it removes 28vdc from recorder relay A13K2.

f. If nose wheelwell DDI manual operation was not completed during five minute period, MMP ENABLE/BRCU switch must again be set to RESET. This starts another five minute period for manual operation of the nose wheelwell DDI.

6. Recorder relay A13K2 energizes:

a. By indicator power on output from recorder central processing unit (cpu) when recorder memory receives a maintenance code during MSDRS APU start mode, normal mode, or nose wheelwell DDI fluids test.

b. By display/BIT power enable discrete from nose wheelwell DDI MAINTENANCE CODE DISPLAY switch or DDI BIT/RESET switch.

7. When the nose wheelwell DDI receives power, it sends an indicator no go output to the recorder and starts a power-on built-in test (BIT). When the power supply stabilizes, it sends a power supply ready output to the data processing circuits. If the nose wheelwell DDI satisfactorily completes power-on BIT, the data processing circuits:

a. Remove indicator no go output to recorder.

b. Inhibit memory clear output to recorder.

c. Send receive enable to timing and input enable circuits.

d. Send acknowledge enable to timing and input enable circuits.

e. Send indicator ready output to recorder. Recorder sends indicator ready output by way of avionic mux channel 1 to digital data computer no. 1 (digital computer no. 1).

8. **FLUIDS TEST.** See WP014 00. The MSDRS does the fluids test independent of the mission computer system. The fluids test computes the status of these fluids on board the aircraft:

a. left engine oil.

b. right engine oil.

c. left AMAD oil.

d. right AMAD oil.

e. APU oil.

f. fire extinguisher fluid.

g. radar liquid cooling system liquid.

9. Pressing and releasing the nose wheelwell DDI FLUIDS CHECK switch starts the fluids test. This sends a ground test enable to the nose wheelwell DDI data processing circuits and to the recorder. The recorder power control circuit detects the ground test enable input and energizes recorder relay A13K1. Energized relay A13K1 sends 28vdc power to the recorder and Signal Data Converter CV-3493/ASM-612 (converter) power supplies.

10. Activation of the recorder power supply causes the recorder cpu to scan the inputs. The recorder cpu detects the ground test enable input. This puts the recorder cpu in the fluids test mode. When in the fluids test mode, the recorder cpu requests fluids test data from the converter over the MSDRS mux. The converter monitors fluid level inputs from seven fluid level sensors. The converter receives the fluid level data and converts it from discrete to digital format. When requested by the recorder, the converter sends the fluid level data by way of the MSDRS mux to the recorder.

11. If the recorder detects a low fluid level, it stores the applicable fluid low maintenance code in memory. When the fluids test is satisfactorily completed, the recorder stores maintenance code 995 in memory. The recorder also sends the fluids low maintenance codes by way of the MSDRS mux to the nose wheelwell DDI for storage and display as below:

a. Recorder central processing unit produces indicator power on command which energizes recorder relay A13K2. Energized relay A13K2 sends 28vdc to nose wheelwell DDI power supply.

b. Nose wheelwell DDI does power-on BIT.

c. Recorder sends receive request output to nose wheelwell DDI.

d. Nose wheelwell DDI sends acknowledge reply to recorder.

e. Recorder sends one data word by way of MSDRS mux to nose wheelwell DDI for storage. Each data word contains maintenance code data and the type of maintenance code (unit fail, fluids low, or test code). During fluid test, this data causes nose wheelwell DDI to set the FLUIDS LOW indicator (black and white). The FLUIDS LOW indicator is black and white as a visual indication that there are fluids low maintenance codes stored in the nose wheelwell DDI.

12. If the data word is complete, the recorder removes the receive request output. This indicates data transfer is complete and the nose wheelwell DDI accepts the data. If the data word is not complete, the nose wheelwell DDI rejects the data and momentarily removes the acknowledge output. This indicates to the recorder that data received by the nose wheelwell DDI was abnormal. The recorder responds by removing the receive request output from the nose wheelwell DDI. The receive request/acknowledge/data cycle repeats for each 16 bit digital data word sent from the recorder to the nose wheelwell DDI.

13. When the recorder completes the data transfer, the nose wheelwell DDI removes the ground test enable input from the recorder. The recorder power control circuit detects the ground test enable input no longer exists. Recorder relays A13K1 and A13K2 deenergize and remove power from the MSDRS. Nose wheelwell DDI displays fluids low maintenance codes during maintenance code display operation.

14. **MAINTENANCE CODE DISPLAY.** See WP014 00. The nose wheelwell DDI has 64 memory locations and can store 62 maintenance codes for display. Two memory locations are reserved for test codes 888 and 000. Pressing and releasing the nose wheelwell DDI MAINTENANCE CODE DISPLAY switch starts the maintenance code display. This sends a display enable to the data processing circuits and display/BIT power enable output to the recorder to energize recorder relay A13K2. Energized relay A13K2 sends 28vdc to the nose wheelwell DDI power supply. Nose wheelwell DDI does a power-on BIT.

15. The display enable input to the data processing circuits causes the maintenance codes stored in nose wheeelwell DDI memory to appear on the MAINTENANCE CODE display (display). A different code appears each time the MAINTENANCE CODE DISPLAY switch is pressed and released. The first display is test code 888. Following 888, all stored maintenance codes appear in the sequence in which the failures occurred. The last display is 000. This indicates the completion of the maintenance code display.

16. Each maintenance code appears for a maximum of 10 seconds. If the MAINTENANCE CODE DISPLAY switch is not pressed again within 10 seconds, the nose wheelwell DDI removes the display/BIT power enable from the recorder. Recorder relay A13K2 deenergizes and removes power from the nose wheelwell DDI. The display restarts with test code 888 by pressing and releasing the MAINTENANCE CODE DISPLAY switch again. Stored maintenance codes appear on the display at the rate of approximately one per second by pressing and holding the MAINTENANCE code display switch.

17. **BUILT-IN TEST.** The nose wheelwell DDI does the built-in tests (BIT) below:

a. power-on BIT

b. periodic BIT

c. initiated BIT

18. **Power-on BIT.** See WP014 00. The nose wheelwell DDI does a power-on BIT each time recorder relay A13K2 energizes and applies power to the nosewheel DDI. The power-on BIT tests these components:

a. microprocessor

b. memory

c. fault indicators

19. The nose wheelwell DDI data processing circuits do the power-on BIT sequence below:

a. Send indicator no go output to recorder.

b. Inhibit memory clear output to recorder.

c. Do a binary to binary coded decimal conversion using test code 888.

d. Test for correct operation of DDI FAIL, FLUIDS LOW, and WPN SYS FAIL indicators.

e. Do a memory test of all memory locations that do not contain a maintenance code.

20. If the nose wheelwell DDI successfully completes power-on BIT, the data processing circuits:

a. Remove indicator no go output to recorder.

b. Reset DDI FAIL indicator (black).

21. If the nose wheelwell DDI fails to satisfactorily complete power-on BIT, the data processing circuits:

a. Send indicator no go output to recorder. As a result, the below occurs:

(1) Recorder sends digital display indicator fail by way of avionic mux channel 1 to digital computer no. 1.

(2) Digital computer no. 1 processes input and stores maintenance code 168 (Digital Display Indicator ID-2150/ASM-612 fail) in memory.

(3) Digital computer no. 1 sends maintenance code 168 to recorder.

(4) Recorder puts maintenance code 168 in memory. Recorder also sends code 168 to nose wheelwell DDI for storage and display. The failure could prevent the nose wheelwell DDI from storing the code. If the code is stored, the WPN SYS FAIL indicator sets (black and white).

b. Set DDI FAIL indicator (black and white).

22. **Periodic BIT.** See WP014 00. The periodic BIT is done approximately every 250 milliseconds during nose wheelwell DDI operation. The periodic BIT takes approximately 50 milliseconds to complete. The recorder interrupts the nose wheelwell DDI periodic BIT to send maintenance code data to the nose wheelwell DDI. When data transfer is completed, the periodic BIT continues. The periodic BIT tests the same functions as the power-on BIT except for the fault indicators, which are not tested during periodic BIT.

23. **Initiated BIT/Reset.** See WP014 00. The nose wheelwell DDI initiated BIT results in the clearing of all maintenance codes stored in the nose wheelwell DDI, recorder, and digital computer no. 1. The initiated BIT does some tests not done during power-on BIT or periodic BIT. The initiated BIT takes approximately 30 seconds to test these components:

a. microprocessor

b. MSDRS mux link input circuits

c. memory

d. display

e. fault indicators.

24. Retracting the switch guard and pressing and releasing the DDI BIT/RESET switch on the nose wheelwell DDI starts the initiated BIT. This sends a BIT enable to the data processing circuits and a display/BIT power enable to the recorder to energize recorder relay A13K2. Energized relay A13K2 sends 28vdc to the nose wheelwell DDI power supply. The nose wheelwell DDI does a power-on BIT. In addition to the tests done during power-on BIT, the data processing circuits do the tests below:

a. Display test code 888 to test all seven segments of each display.

b. Ability to process simulated input data.

c. Ability to address memory by storing and retrieving test data.

d. A memory test which results in clearing all maintenance codes from the nose wheelwell DDI memory. The microprocessor does the memory test by consecutively storing ones and zeroes, zeroes and ones, and then all zeroes in each location of the two 32 x 16 bit electrically alterable read only memories. The microprocessor then decodes the ten most significant binary bits into a decimal number and tests for stuck bits as below:

(1) When alternating ones and zeroes are properly stored and decoded, test code 682 appears on the display. The microprocessor then tests all memory locations for a stuck bit. A stuck bit appears on the display as any number other than 682.

(2) When alternating zeroes and ones are properly stored and decoded, test code 341 appears on the display. The microprocessor then tests all memory locations for a stuck bit. A stuck bit appears on the display as any number other than 341.

(3) For the final test, the microprocessor stores zeroes in each memory location. The microprocessor then does a memory sum test to verify there are no stuck bits. Test code 000 appears on the display as a result of the memory sum test.

25. If the nose wheelwell DDI satisfactorily completes the initiated BIT, the data processing circuits:

a. Reset DDI FAIL indicator (black).

b. Remove indicator no go output to recorder.

c. Send memory clear output to recorder. As a result, the below occurs:

(1) Recorder clears maintenance codes from memory.

(2) Recorder sends memory clear output by way of avionic mux channel 1 to digital computer no. 1.

(3) Digital computer no. 1 clears maintenance codes from memory.

(4) Digital computer no. 1 sends memory clear reset to recorder.

(5) Recorder sends memory clear reset to nose wheelwell DDI.

(6) Nose wheelwell DDI removes memory clear output from recorder.

26. If the nose wheelwell DDI fails to satisfactorily complete the initiated BIT, the data processing circuits:

a. Inhibit memory clear output to recorder. This prevents clearing maintenance codes from recorder and digital computer no. 1.

b. Send indicator no go output to recorder. As a result, the below occurs:

(1) Recorder sends digital display indicator fail by way of avionic mux channel 1 to digital computer no. 1.

(2) Digital computer no. 1 processes input and stores maintenance code 168 (Digital Display Indicator ID-2150/ASM-612 fail) in memory.

(3) Digital computer no. 1 sends maintenance code 168 to recorder.

(4) Recorder puts maintenance code 168 in memory. Recorder also sends code 168 to nose wheelwell DDI for storage and display. The failure could prevent the nose wheelwell DDI from storing the code. If the code is stored, the WPN SYS FAIL indicator sets (black and white).

c. Set DDI FAIL indicator (black and white).

27. **Reset on Takeoff - WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 84A AND UP.** See WP023 00. After a normal take-off when aircraft indicated airspeed is greater than 80 knots for 20 seconds, the below occurs:

a. Digital computer no. 1 sends reset memory output to recorder.

b. Recorder clears maintenance codes from memory.

c. Recorder sends reset memory output to nose wheelwell DDI.

d. Nose wheelwell DDI clears maintenance codes-from memory.

e. If digital computer no. 1 and no. 2 memory alteration maintenance codes 034 and 037 and digital computer no. 2 fail code 036 were set before memory was cleared, they are reentered in memory.

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - DIGITAL DISPLAY INDICATOR ID-2150/ASM-612

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP014 00, dated 15 May 1985.

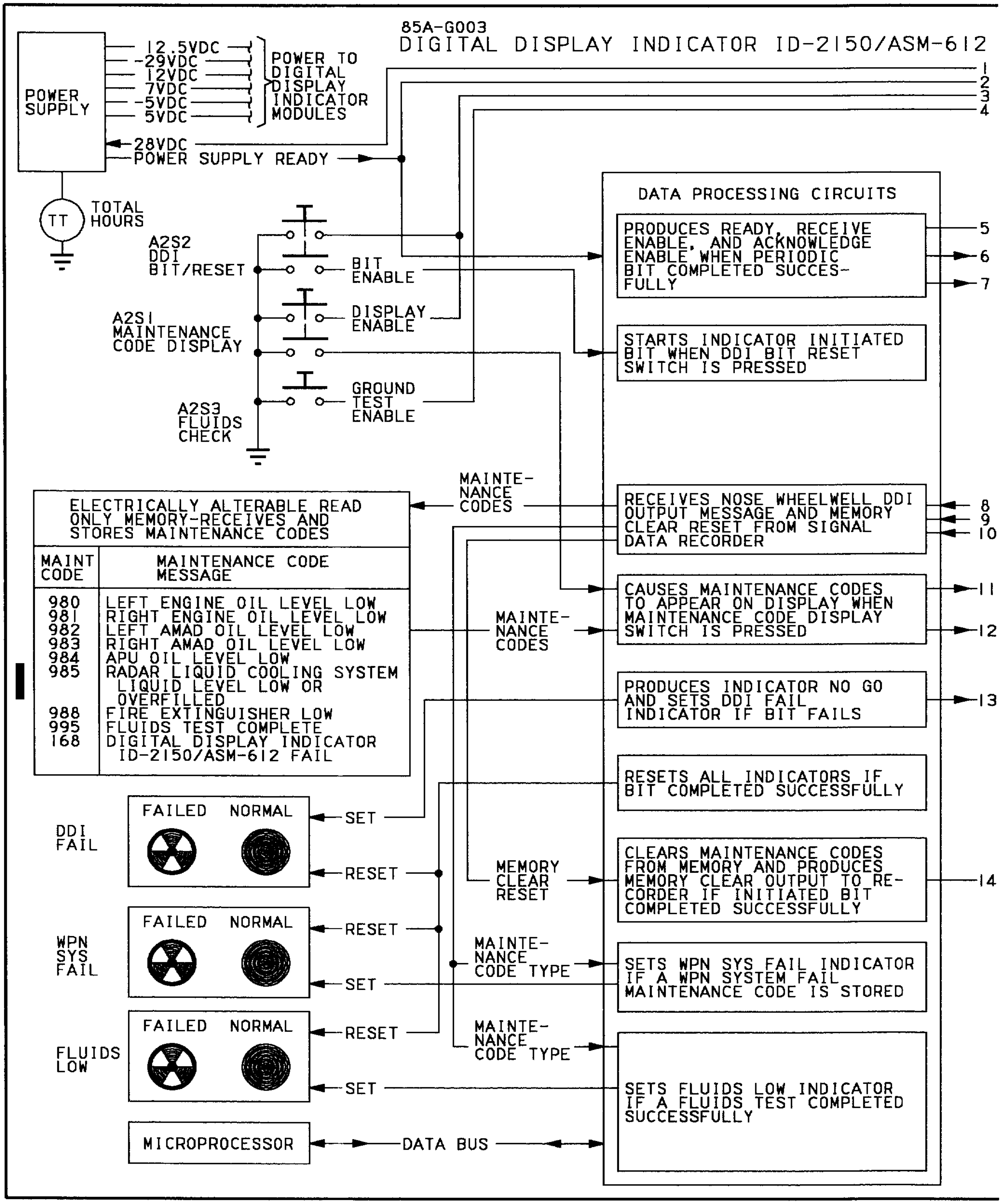
Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None



18AC-580-10-(9-1)D-GRID

Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 1)

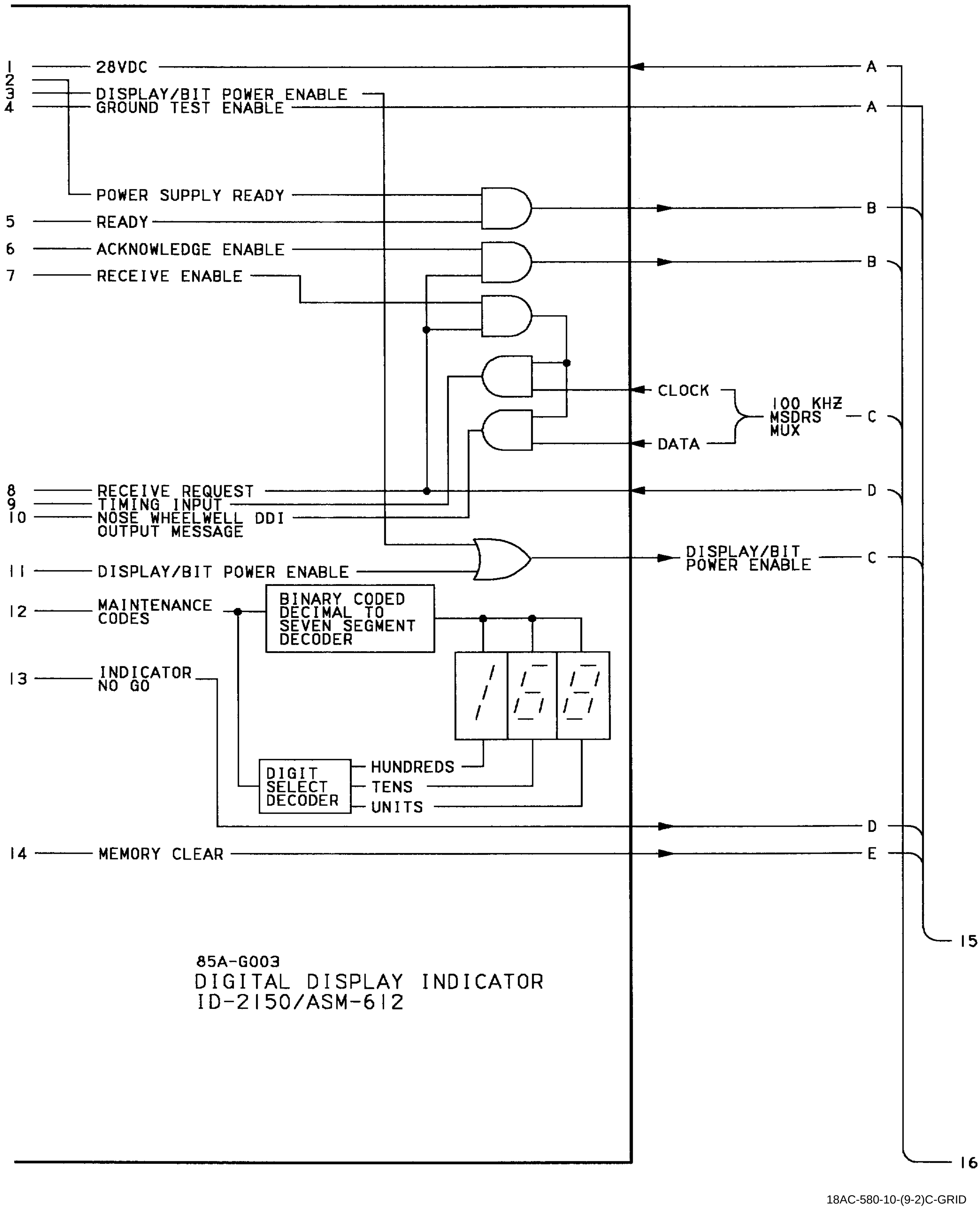
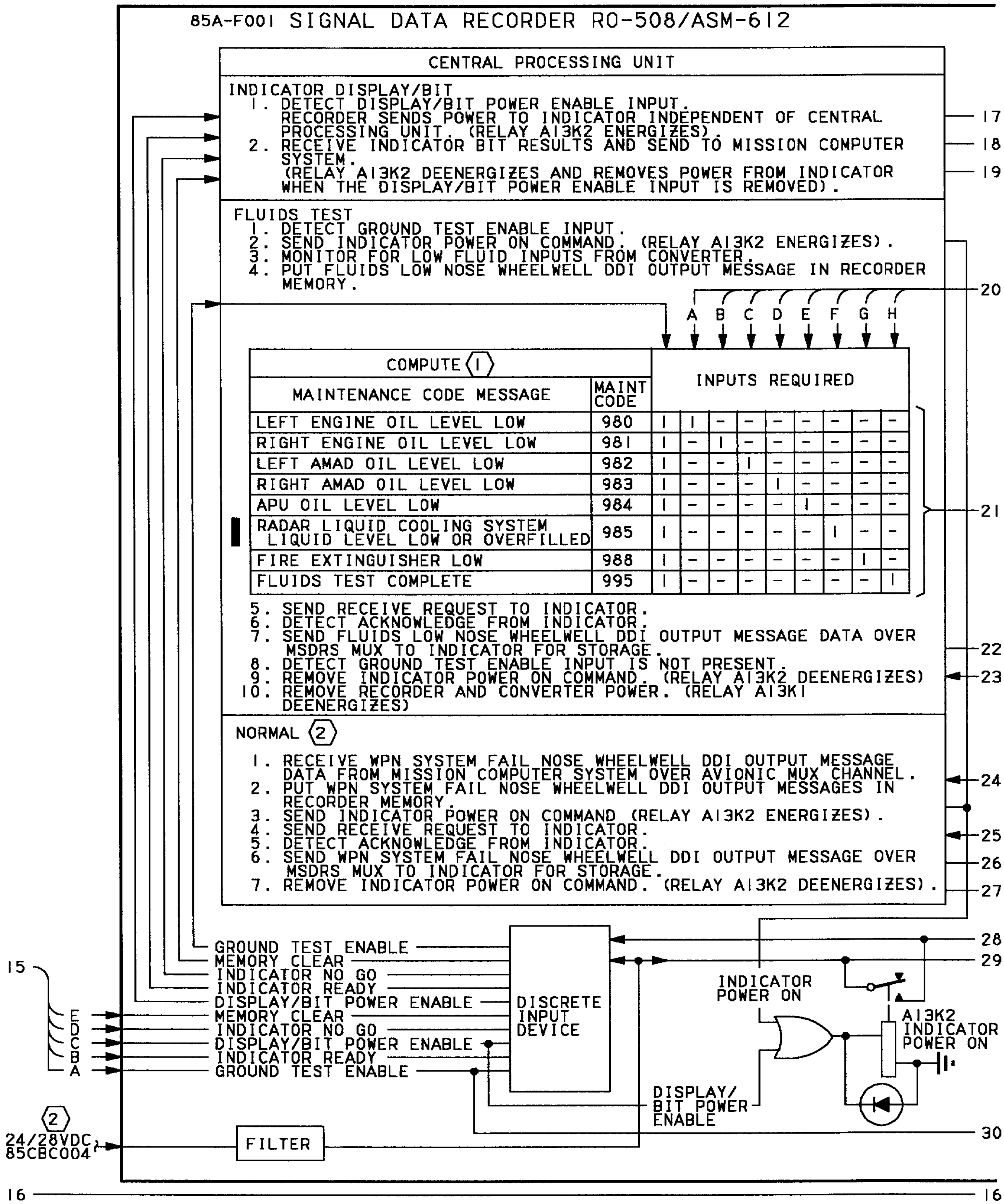


Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 2)



MAINTENANCE CODE MESSAGE	MAINT CODE		A	B	C	D	E	F	G	H
LEFT ENGINE OIL LEVEL LOW	980	1	1	-	-	-	-	-	-	-
RIGHT ENGINE OIL LEVEL LOW	981	1	-	1	-	-	-	-	-	-
LEFT AMAD OIL LEVEL LOW	982	1	-	-	1	-	-	-	-	-
RIGHT AMAD OIL LEVEL LOW	983	1	-	-	-	1	-	-	-	-
APU OIL LEVEL LOW	984	1	-	-	-	-	1	-	-	-
RADAR LIQUID COOLING SYSTEM LIQUID LEVEL LOW OR OVERFILLED	985	1	-	-	-	-	-	1	-	-
FIRE EXTINGUISHER LOW	988	1	-	-	-	-	-	-	1	-
FLUIDS TEST COMPLETE	995	1	-	-	-	-	-	-	-	1

18AC-580-10-(9-3)D-GRID

Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 3)

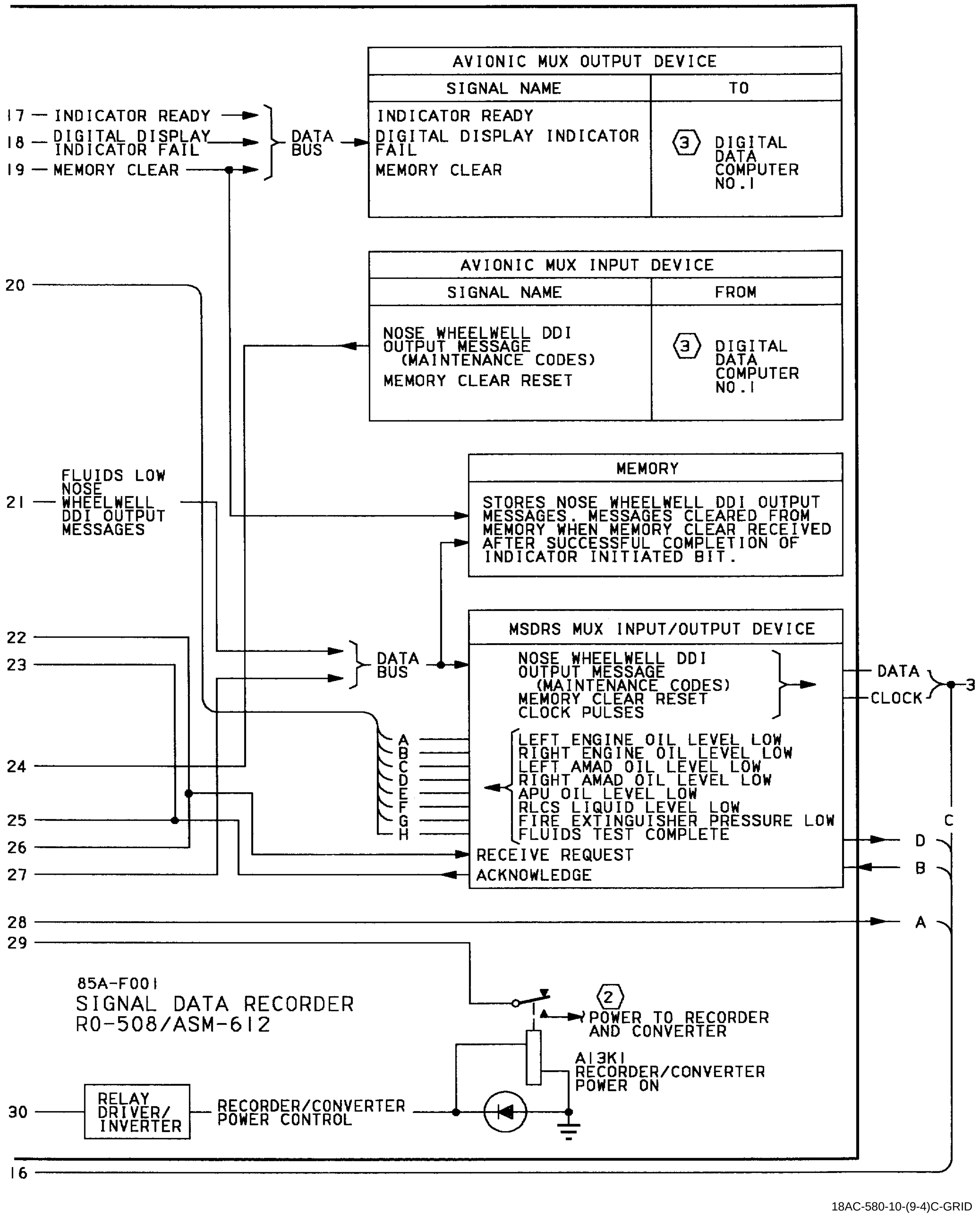


Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 4)

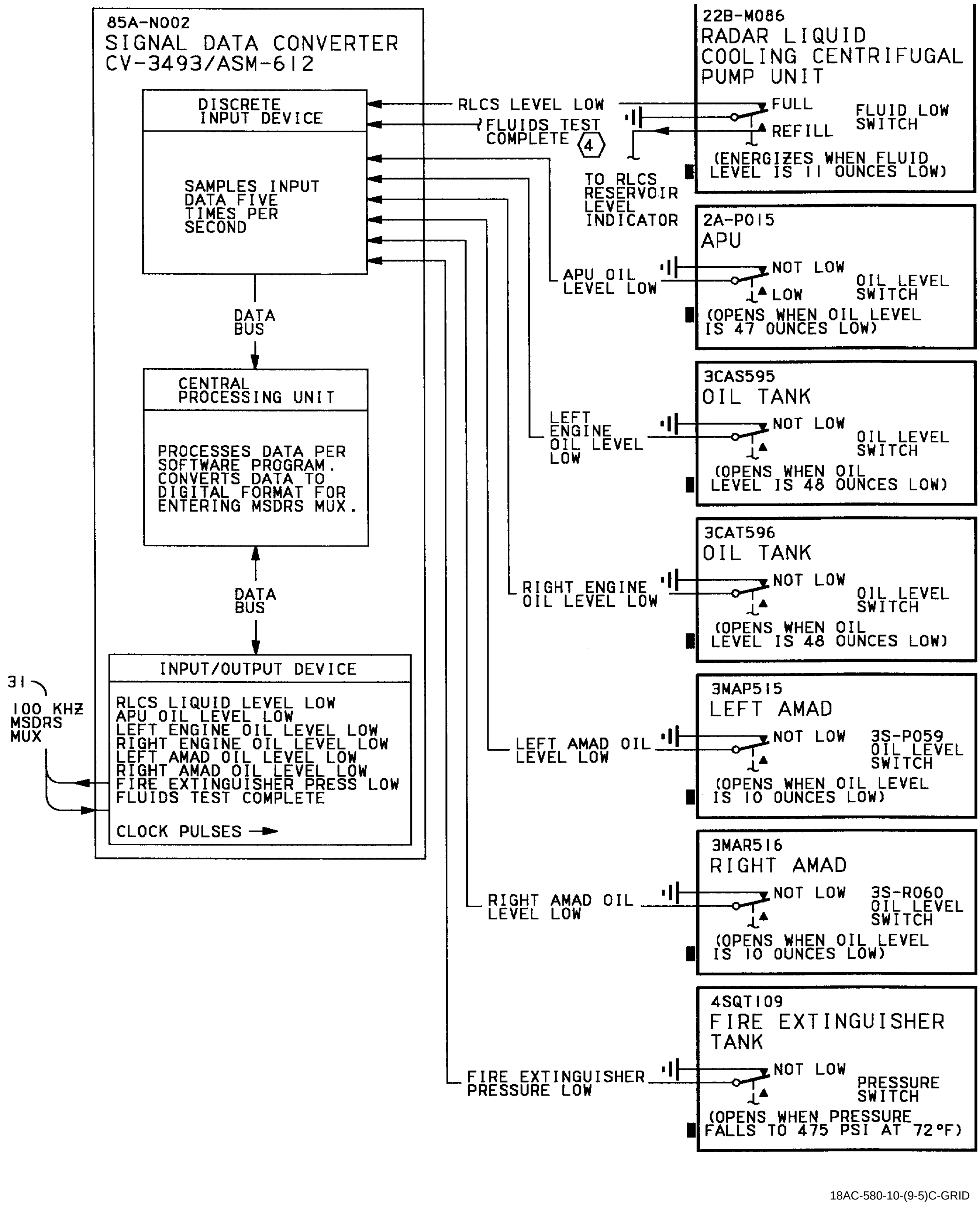


Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 5)

LEGEND

⟨1⟩ EXPLANATION OF MATRIX

A. COMPUTE COLUMN IS THE SIGNAL OUTPUT.
B. INPUTS REQUIRED COLUMN IS READ VERTICALLY AND USED TO DEVELOP THE COMPUTED SIGNAL OUTPUT.
C. COMPUTED SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL.
D. INTERPRET MATRIX TABLE AS INDICATED:

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.
(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.
(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

⟨2⟩ SIMPLIFIED POWER SCHEMATIC, WP005 00.

⟨3⟩ SIGNAL DATA RECORDING SET AN/ASM-612 BUILT-IN TEST SIMPLIFIED SCHEMATIC, WP016 00.

⟨4⟩ INPUT ALWAYS OPEN TO INDICATE FLUIDS TEST COMPLETE.

18AC-580-10-(9-6)A-GRID

Figure 1. Digital Display Indicator ID-2150/ASM-612 Simplified Schematic (Sheet 6)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

OPERATION - BUILT-IN TEST

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP015 00, dated 1 August 1988.

Reference Material

Maintenance Status Display and Recording System A1-F18AC-580-100
Simplified Schematic - Signal Data Recording Set AN/ASM-612 Built-In Test WP016 00

Alphabetical Index

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 253	-	U.S. Naval Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-

1. INTRODUCTION.

2. The maintenance status display and recording system (MSDRS) operations are:

a. power requirements (WP005 00).

b. 100 kHz MSDRS mux bus (WP005 00).

c. data acquisition (WP005 00).

d. data processing (WP005 00).

e. Digital Display Indicator ID-2150/ASM-612 interface (WP013 00).

f. built-in test.

3. BUILT-IN TEST.

4. The operations for the Signal Data Recording Set (SDRS) AN/ASM-612 built-in tests (BIT) are:

a. power-on BIT.

b. periodic BIT.

c. initiated BIT.

5. **POWER-ON BIT.** See WP006 00. When power is applied, the SDRS does a start sequence. When the SDRS completes the start sequence, the recorder sends a SDRS mux ready output (high) to mission computer system Digital Data Computer No. 1 (digital computer no. 1). This indicates to digital computer no. 1 that the SDRS is ready to start operation. If the SDRS mux ready output is low, digital computer no. 1 does the below.

a. Commands cockpit DDI to display:

(1) CAUT DEGD caution.

(2) SDRS BIT status message - NOT RDY.

b. Sends master caution set output by way of avionic mux channel 1 to Control-Converter C-10382/A (control-converter). The control-converter changes the digital input to a discrete output to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

c. Sends ICS caution tone 1 (master caution tone command) by way of avionic mux channel 1 to recorder. The recorder converts the digital input to a discrete output to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A to start the master caution tone heard in the headset.

6. The conditions below cause the SDRS mux ready output from the recorder to digital computer no. 1 to be low:

a. SDRS not turned on.

b. SDRS not completing start sequence.

c. SDRS has a catastrophic failure.

7. **PERIODIC BIT.** During normal operation, the converter and recorder continuously do a periodic BIT. The cartridge periodic BIT is not continuous, but is done one time each second. The periodic BIT does not interfere with system operation. A complete periodic BIT of all recorder, converter, and cartridge components requires approximately 52 seconds. For most components the periodic BIT is the same as the initiated BIT. To prevent interfering with operation, the recorder output discrete processing tests and cartridge tests are not as thorough as initiated BIT.

8. **161353 THRU 161924.** The MSDRS periodic BIT reports failures in the functional components below:

a. converter 100 kHz mux link terminal.

b. converter central processing unit.

c. recorder 100 kHz mux link terminal.

d. recorder central processing unit.

9. If any of these functional components fail three consecutive tests, the failure indications below occur:

a. Recorder sends applicable function fail by way of avionic mux channel 1 to digital computer no. 1

b. Digital computer no. 1 processes inputs and does the below:

(1) Commands cockpit DDI to display CAUT DEGD caution.

(2) Sends master caution set output by way of avionic mux channel 1 to control-converter. The control-converter changes the digital input to a discrete output to the LH

advisory and threat warning indicator panel to light the MASTER CAUTION light.

(3) Sends ICS caution tone 1 (master caution tone command) by way of avionic mux channel 1 to recorder. The recorder converts the digital input to a discrete output to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A to start the master caution tone heard in the headset.

10. **161925 AND UP.** The SDRS periodic BIT looks for a CAUT DEGD condition the same as for 161353 THRU 161924. If a CAUT DEGD condition is detected, the periodic BIT functions the same as initiated BIT. If digital computer no. 1 detects a failure of the converter, recorder, cartridge, or nose wheelwell DDI, it sends the applicable maintenance code by way of avionic mux channel 1 through the recorder to the nose wheelwell DDI for storage and display.

11. The master caution light and master caution tone function the same as for 161353 THRU 161924.

12. **INITIATED BIT.** See WP016 00. The SDRS initiated BIT tests the units below:

a. Signal Data Converter CV-3493/ASM-612 (converter)

b. Signal Data Recorder RO-608/ASM-612 (recorder)

c. Magnetic Tape Cartridge MX-9972/ASM-612 (cartridge)

13. Pressing the SDRS pushbutton switch on the cockpit Digital Display Indicator IP-1317( ) (cockpit DDI) BIT control display starts the converter, recorder, and cartridge initiated BIT.

14. If the SDRS mux ready output from the recorder to digital computer no. 1 is high when the cockpit DDI BIT control display SDRS pushbutton is pressed, the below occurs:

a. Digital computer no. 1 sends BIT initiate output by way of avionic mux channel 1 to recorder.

b. Recorder starts recorder/cartridge BIT and sends converter BIT initiate by way of MSDRS mux to converter to start converter BIT.

c. Recorder sends BIT in test output to digital computer no. 1.

d. Digital computer no. 1 commands cockpit DDI to display SDRS BIT status message IN TEST. If the BIT in test output to digital computer no. 1 exists and the 160 second SDRS BIT time limit ends before all units complete BIT, the cockpit DDI displays SDRS BIT status message RESTRT.

15. When the converter, recorder, and cartridge satisfactorily complete BIT, the recorder sends an initiated BIT complete output by way of avionic mux channel 1 to digital computer no. 1. The cockpit DDI displays SDRS BIT status message GO. If digital computer no. 1 inputs BIT in test and initiated BIT complete are not present, the cockpit DDI displays SDRS BIT status message RESTRT.

16. **Signal Data Converter CV-3493/ASM-612.** See WP016 00. The converter functional components tested by BIT are:

a central processing unit.

b. program memory.

c. scratchpad memory.

d. DC bridge input processing.

e. thermocouple input processing.

f. 0-5vdc analog input processing.

g. AC tachometer input processing.

h. fuel flowmeter input processing.

i. discrete input processing.

j. engine accelerometer (vibration) input processing.

17. The BIT tests converter functional components at intervals from one time each second to one time each 16 seconds. The converter BIT simulates inputs and determines if BIT program results agree with predetermined stored results. If all functional components satisfactorily complete BIT, the below occurs:

a. Converter sends converter go output by way of MSDRS mux to recorder.

b. Recorder inhibits signal data converter fail and SDRS no go outputs to digital computer no. 1.

c. Converter fault indicator resets (black).

18. If any functional component fails three consecutive tests, the failure indications below occur:

a. Converter inhibits converter go output to recorder.

b. Recorder sends SDRS no go and signal data converter fail by way of avionic mux channel 1 to digital computer no. 1.

c. Digital computer no. 1 processes inputs and does the below:

(1) Stores maintenance code 167 (signal data converter fail) in memory.

(2) Sends maintenance code 167 by way of avionic mux channel 1 to recorder.

(3) Commands cockpit DDI to display:

(a) CAUT DEGD caution.

(b) SDRS BIT status message DEGD.

(c) BIT advisory ADV - BIT.

(4) Sends master caution set output by way of avionic mux channel 1 to control-converter. The control-converter changes the digital input to a discrete output to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

(5) Sends ICS caution tone 1 (master caution tone command) by way of avionic mux channel 1 to recorder. The recorder converts the digital input to a discrete output to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A to start the master caution tone heard in the headset.

d. Recorder puts maintenance code 167 in memory and also sends it by way of MSDRS mux to nose wheelwell DDI for storage and display.

e. Nose wheelwell DDI WPN SYS FAIL indicator sets (black and white).

f. Converter fault indicator sets (black and white).

g. Recorder inhibits failed function validity output to digital computer no. 1.

19. On 161925 AND UP, if DC bridge input processing circuits fail three consecutive tests, the failure indications below occur:

a. Converter inhibits converter go output to recorder.

b. Recorder sends SDRS no go and signal data converter fail by way of avionic mux channel 1 to digital computer no. 1

c. Digital computer no. 1 processes inputs and does the below:

(1) Stores maintenance code 169 (strain circuit failure) in memory.

(2) Sends maintenance code 169 by way of avionic mux channel 1 to recorder.

(3) Commands cockpit DDI to display:

(a) CAUT DEGD caution.

(b) SDRS BIT status message DEGD.

(c) BIT advisory ADV - BIT.

(4) Sends master caution set output by way of avionic mux channel 1 to control-converter. The control-converter changes the digital input to a discrete output to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

(5) Sends ICS caution tone 1 (master caution tone command) by way of avionic mux channel 1 to recorder. The recorder converts the digital input to a discrete output to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A to start the master caution tone heard in the headset.

d. Recorder puts maintenance code 169 in memory and also sends it by way of MSDRS mux to nose wheelwell DDI for storage and display.

e. Nose wheelwell DDI WPN SYS FAIL indicator sets (black and white).

f. Converter fault indicator sets (black and white).

g. Recorder inhibits DC bridge data function validity output to digital computer no. 1.

20. **Signal Data Recorder RO-508/ASM-612.** See WP016 00. The recorder functional components tested by BIT are:

a. central processing unit.

b. program memory.

c. scratchpad memory.

d. recorder to converter 100 kHz MSDRS mux link.

e. discrete output processing.

f. discrete input processing.

g. power control.

h. cartridge and recorder electronics.

21. The BIT tests recorder functional components at intervals from one time each 50 milliseconds to one time each 52 seconds. The recorder BIT simulates inputs and determines if BIT program results agree with predetermined stored results. If all functional components satisfactorily complete BIT, the below occurs:

a. Recorder inhibits signal data recorder fail and SDRS no go outputs to digital computer no. 1.

b. Recorder fault indicator resets (black).

22. If any functional component fails three consecutive tests, the failure indications below occur:

a. Recorder sends SDRS no go and signal data recorder fail by way of avionic mux channel 1 to digital computer no. 1.

b. Digital computer no 1 processes inputs and does the below:

(1) Stores maintenance code 165 (signal data recorder fail) in memory.

(2) Sends maintenance code 165 by way of avionic mux channel 1 to recorder.

(3) Commands cockpit DDI to display:

(a) CAUT DEGD caution.

(b) SDRS BIT status message DEGD.

(c) BIT advisory ADV-BIT.

(4) Sends master caution set output by way of avionic mux channel 1 to control-converter. The control-converter changes the digital input to a discrete output to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light.

(5) Sends ICS caution tone 1 (master caution tone command) by way of avionic mux channel 1 to recorder. The recorder converts the digital input to a discrete output to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A to start the master caution tone heard in the headset.

c. Recorder puts maintenance code 165 in memory and also sends it by way of MSDRS mux to nose wheelwell DDI for storage and display.

d. Nose wheelwell DDI WPN SYS FAIL indicator sets (black and white).

e. Recorder fault indicator sets (black and white).

f. Recorder inhibits failed function validity output to digital computer no. 1.

23. The recorder tests the recorder to converter MSDRS mux link by sending data by way of the mux link and commanding its return. The recorder compares the data sent with the data returned. The recorder also tests to see that the data transfer is done within the correct time.

24. If the recorder mux link circuits fail to transmit/receive data correctly, the failure indications in paragraph 22 occur. If the converter mux link circuits fail to transmit/receive data correctly, the recorder sends a converter terminal fail discrete to the converter. This sets the converter fault indicator (black and white). The failure indications in paragraph 18 occur. The recorder to nose wheelwell DDI MSDRS mux link is not tested.

25. During MSDRS BIT, digital computer no. 1 sends a test word by way of avionic mux channel 1 to the recorder to test the recorder avionic mux terminals. Digital computer no. 1 then commands the recorder to return the test word. Digital computer no. 1 compares the test word sent with the test word returned. If either avionic mux bus (1X or 1Y) input/output device fails, the below occurs:

a. Digital computer no. 1 stores maintenance code 030 (signal data recorder terminal fail) in memory.

b. Digital computer no. 1 sends maintenance code 030 by way of avionic mux channel 1 to recorder.

c. Recorder puts maintenance code 030 in memory and also sends it by way of MSDRS mux to nose wheelwell DDI for storage and display.

d. Nose wheelwell DDI WPN SYS FAIL indicator sets (black and white).

26. If both avionic mux bus input/output devices fail, no maintenance codes can be sent to the MSDRS. Digital computer no. 1 does the below:

a. Stores maintenance code 030 (signal data recorder terminal fail) in memory.

b. Commands cockpit DDI to display:

(1) CAUT DEGD caution.

(2) SDRS BIT status message NO GO.

(3) BIT advisory ADV-BIT.

c. Sends master caution set output by way of avionic mux channel 1 to control-converter. The control-converter changes the digital input to a discrete output to the LH advisory and threat warning indicator panel to light the MASTER CAUTION light. Since digital computer no. 1 cannot communicate with the recorder to start the master caution tone command, digital computer no. 1 sends voice cue discretes by way of avionic mux channel 1 to the control-converter. The control-converter changes the digital inputs to voice cue discrete outputs to the Intercommunication Amplifier-Control AM-6979/A or AM-7360/A or, after F/A-18 AFC 253 or F/A-18 AFC 292, AM-7539/A to start the master caution tone heard in the headset.

27. **Magnetic Tape Cartridge MX-9972/ASM-612.** See WP016 00. The recorder commands the cartridge and tests for correct operation in four basic modes: write, read, erase, and slew. If the cartridge satisfactorily completes BIT, the below occurs:

a. Recorder inhibits magnetic tape cartridge fail and SDRS no go outputs to digital computer no. 1.

b. Cartridge fault indicator resets (black).

28. If the cartridge fails BIT, the failure indications below occur:

a. Recorder sends magnetic tape cartridge fail by way of avionic mux channel 1 to digital computer no. 1.

b. Digital computer no. 1 processes inputs and does the below:

(1) Stores maintenance code 166 (magnetic tape cartridge fail) in memory.

(2) Sends maintenance code 166 by way of avionic mux channel 1 to recorder.

(3) Commands cockpit DDI to display:

(a) SDRS BIT status message DEGD.

(b) BIT advisory ADV-BIT.

c. Recorder puts maintenance code 166 in memory and also sends it by way of MSDRS mux to nose wheelwell DDI for storage and display.

d. Nose wheelwell DDI WPN SYS FAIL indicator sets (black and white).

e. Cartridge fault indicator sets (black and white).

f. Recorder inhibits cartridge and recorder electronics function validity output to digital computer no. 1.

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - SIGNAL DATA RECORDING SET AN/ASM-612 BUILT-IN TEST

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

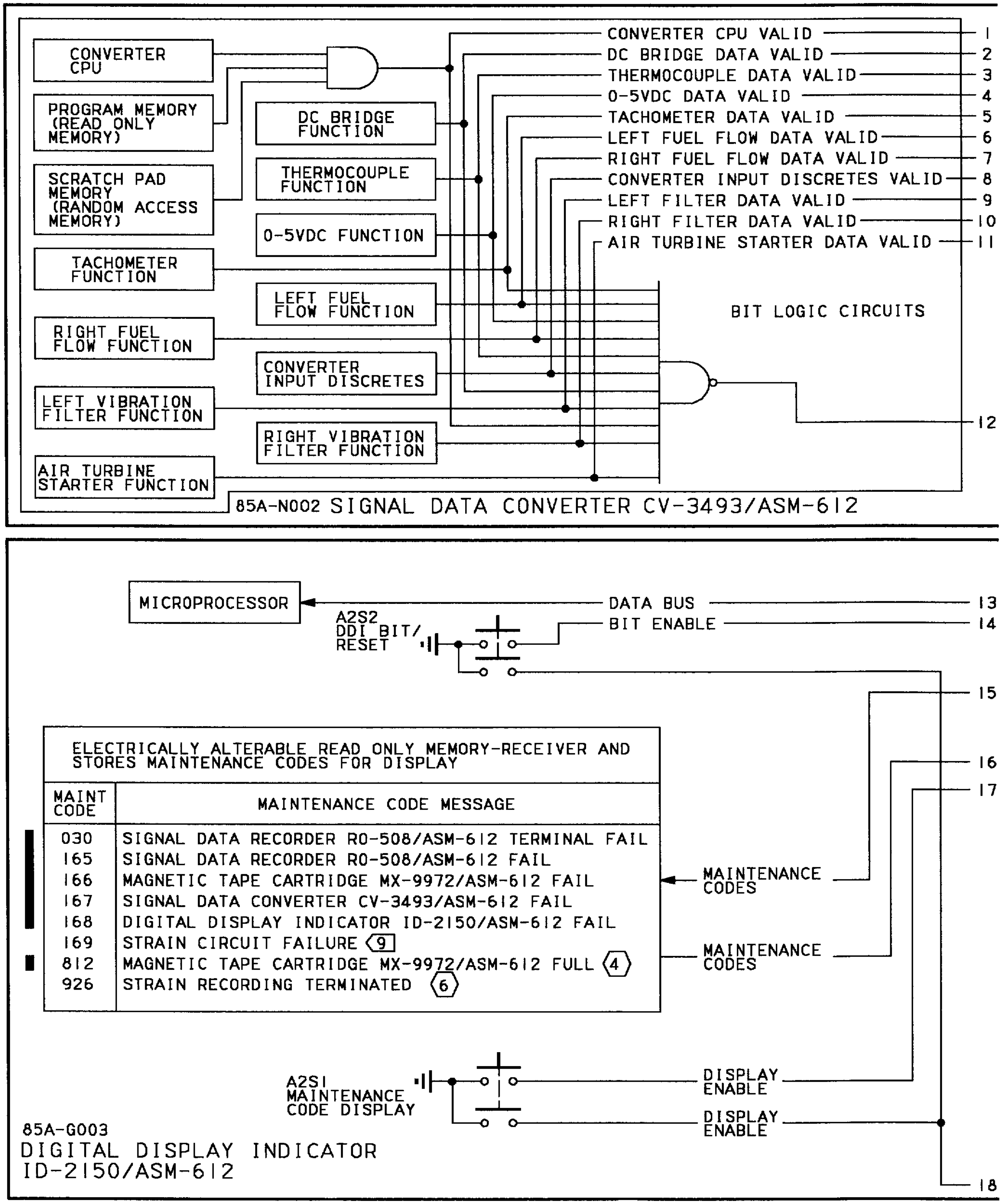
Reference Material

None

Alphabetical Index

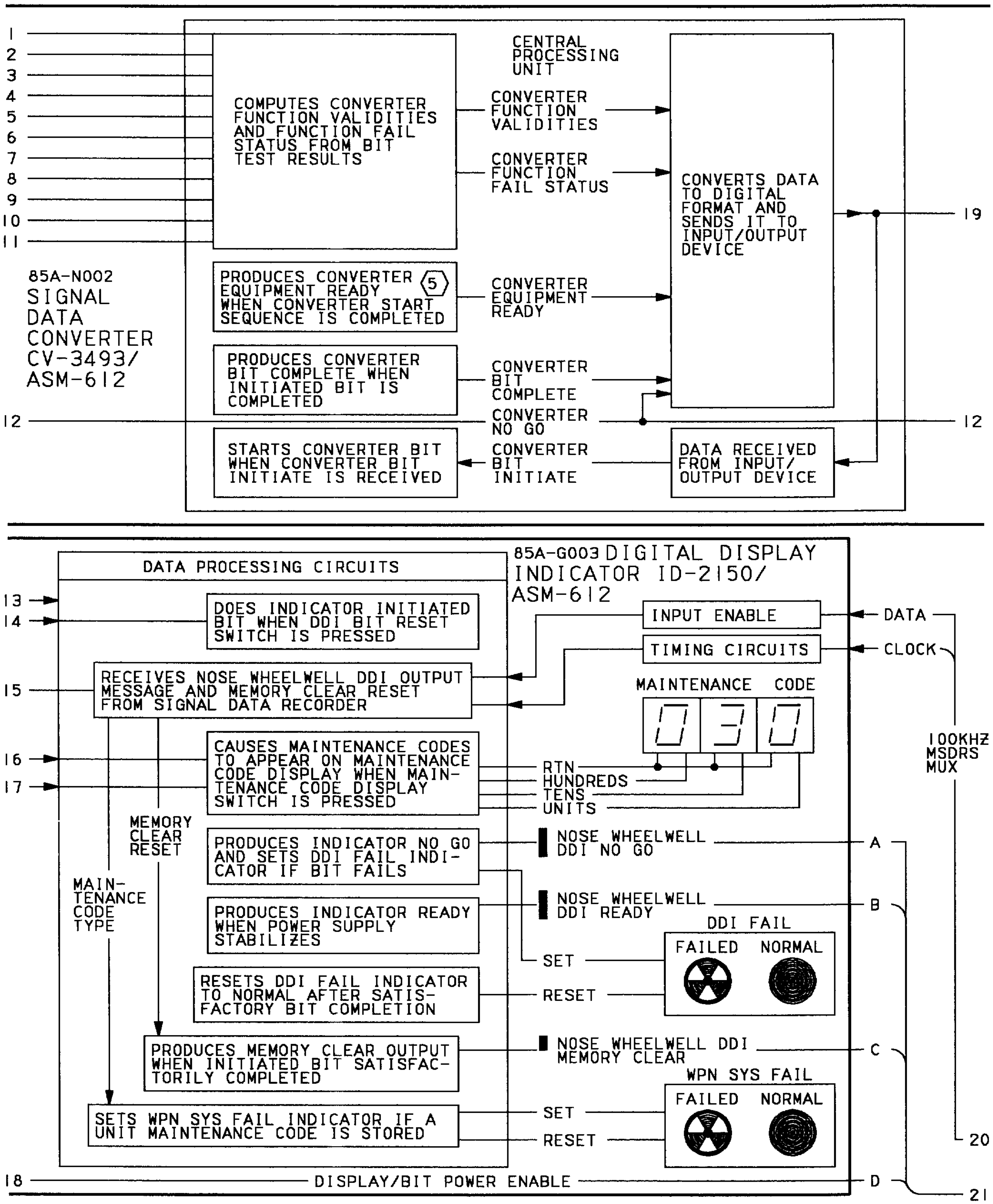
Record of Applicable Technical Directives

None



18AC-580-10-(8-1)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 1)



18AC-580-10-(8-2)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 2)

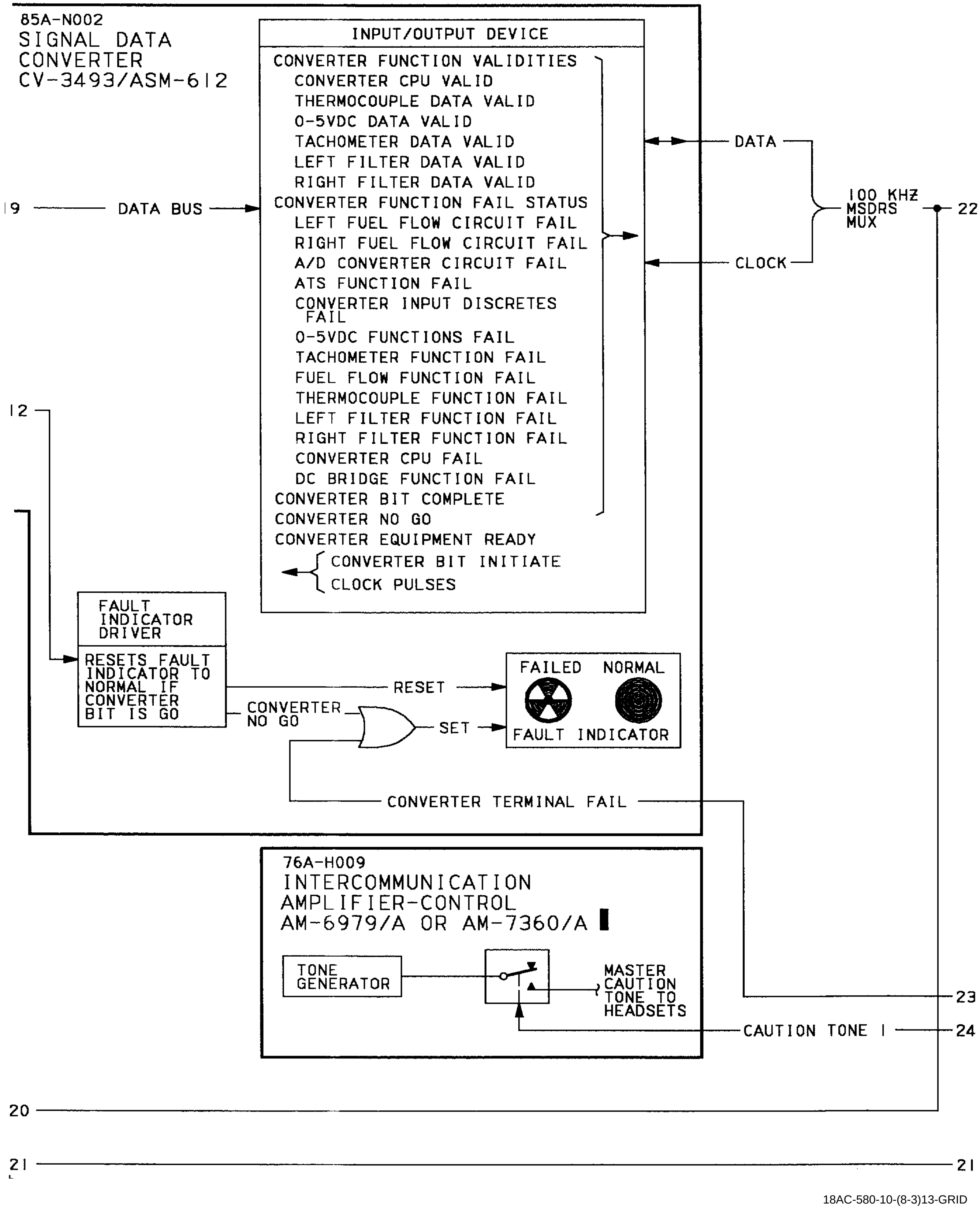
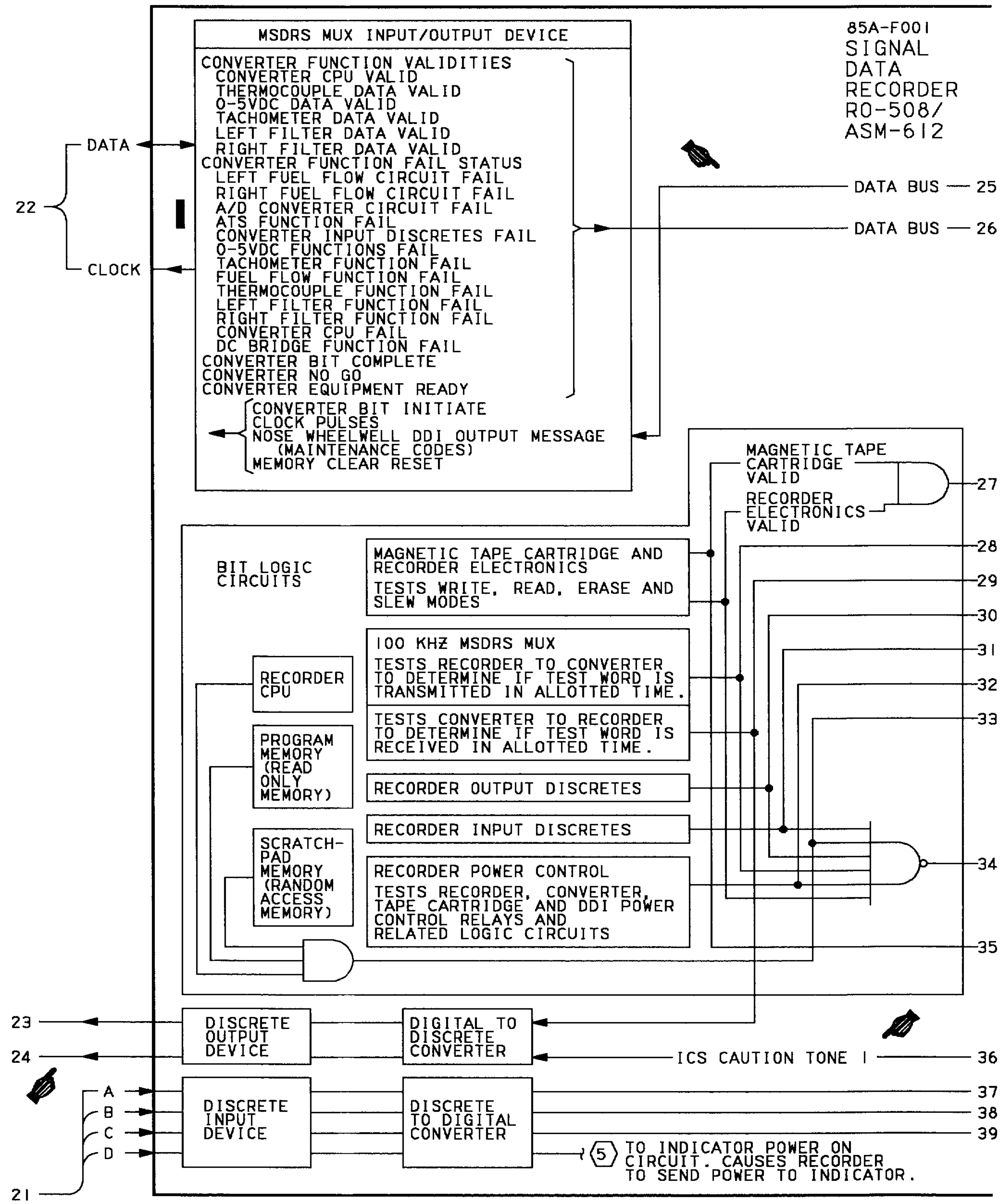
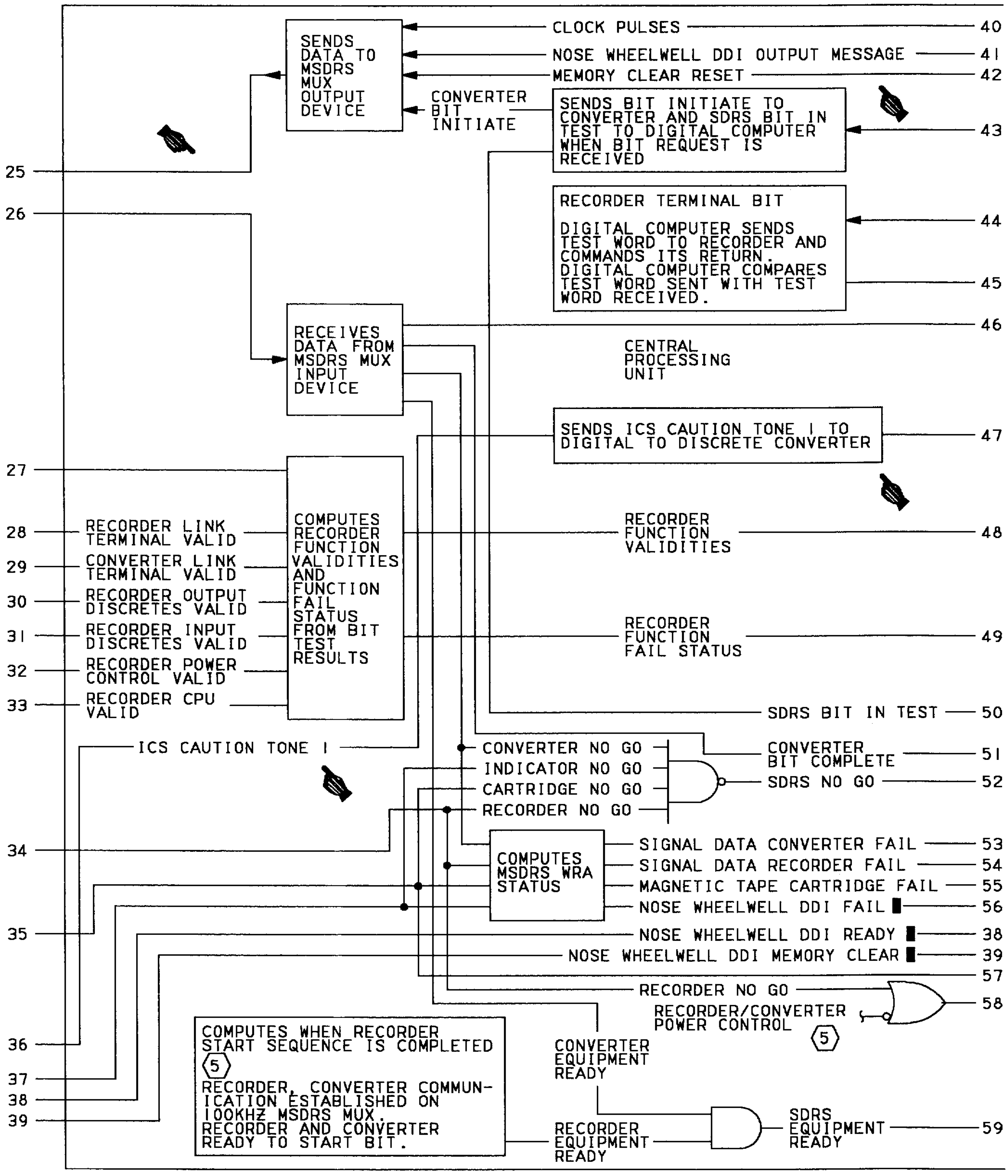


Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 3)



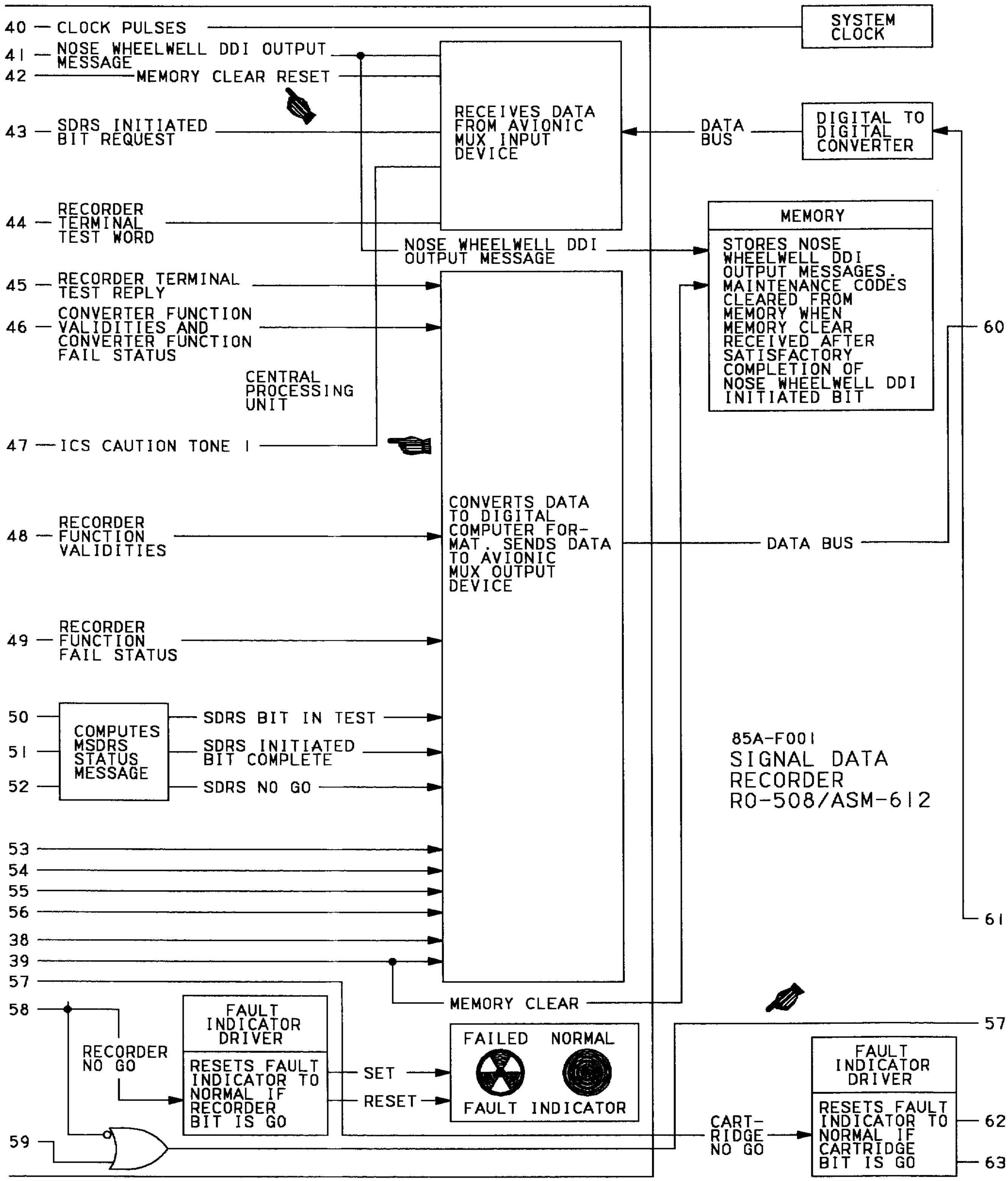
18AC-580-10-(8-4)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 4)



18AC-580-10-(8-5)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 5)



18AC-580-10-(8-6)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 6)

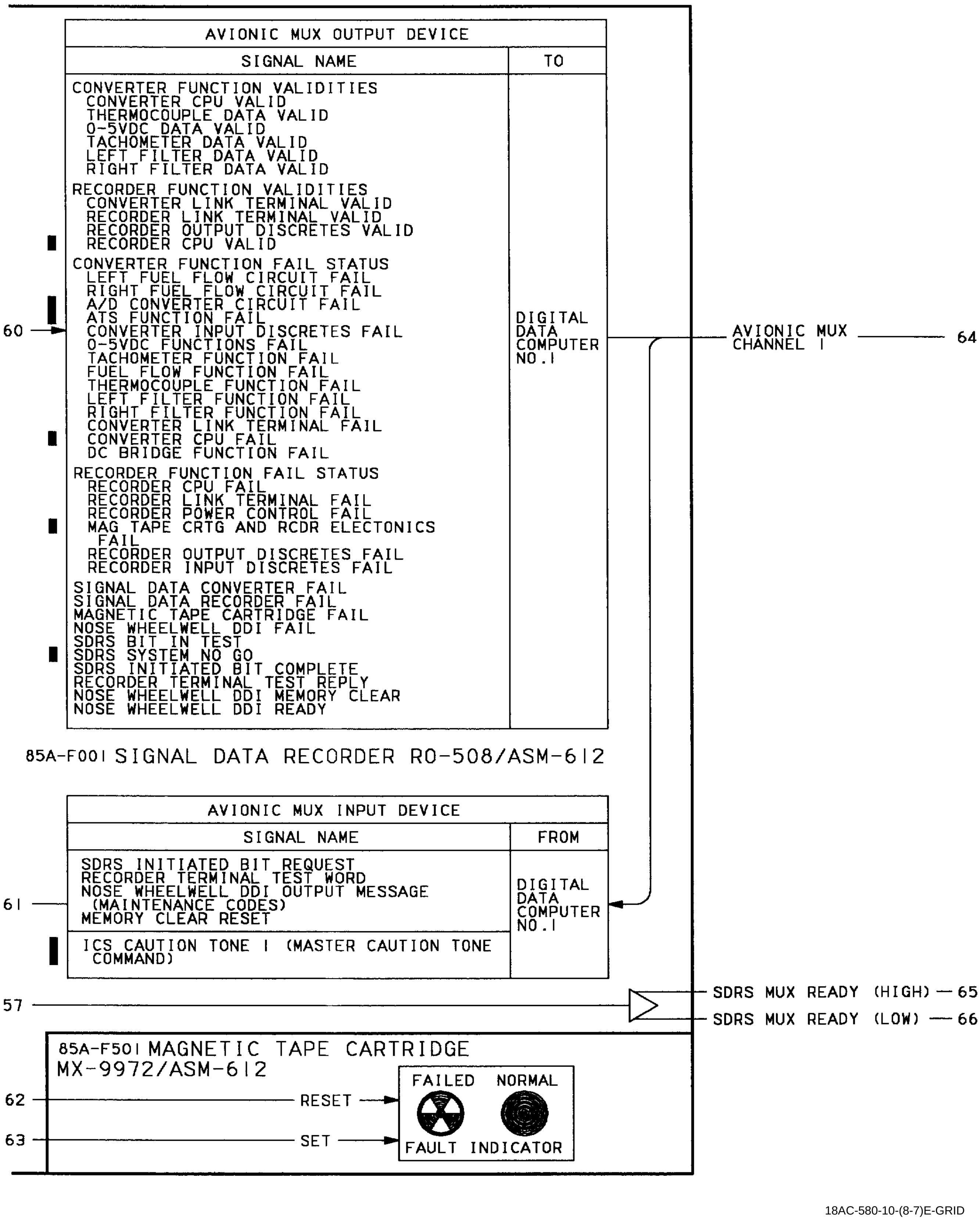
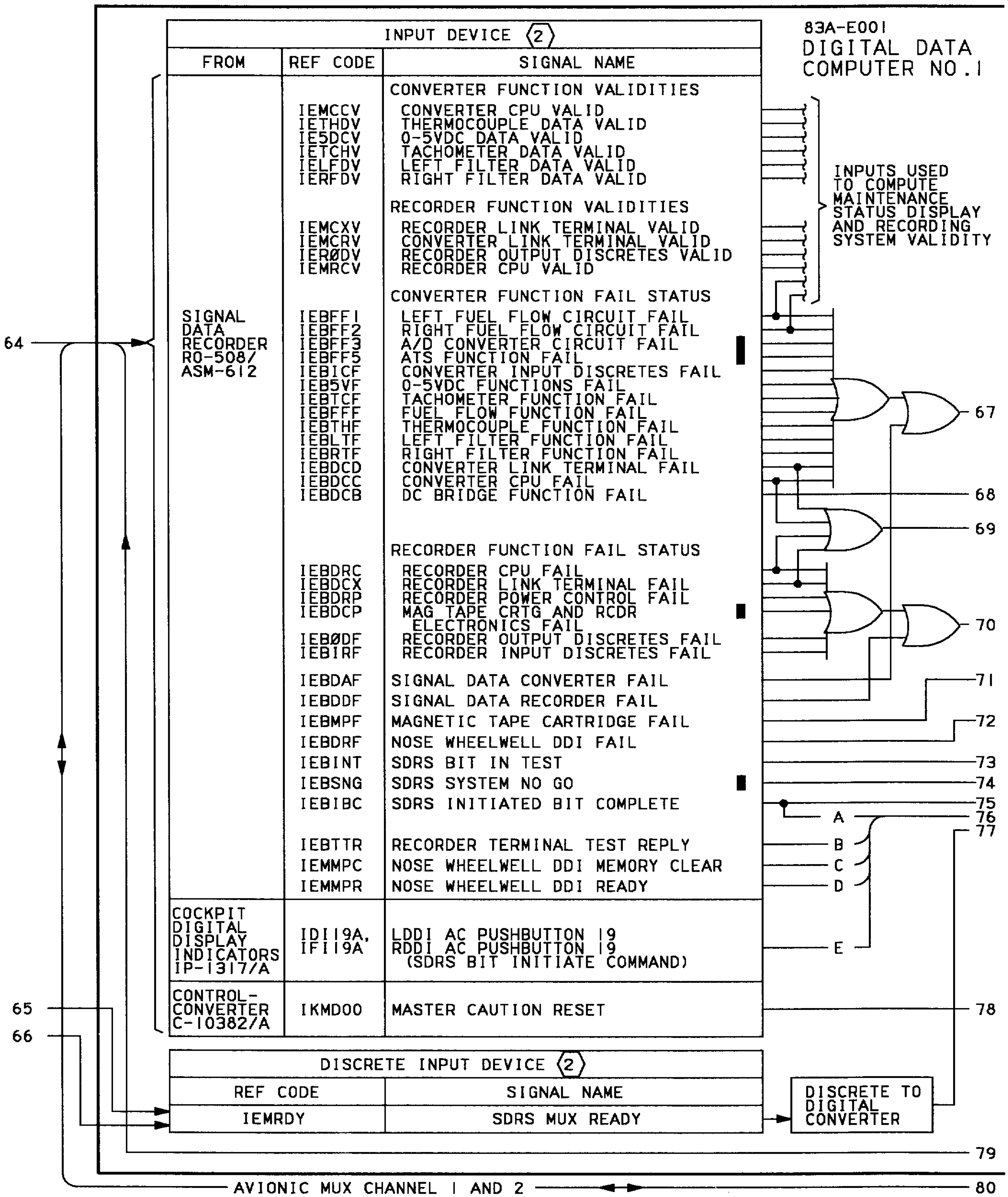
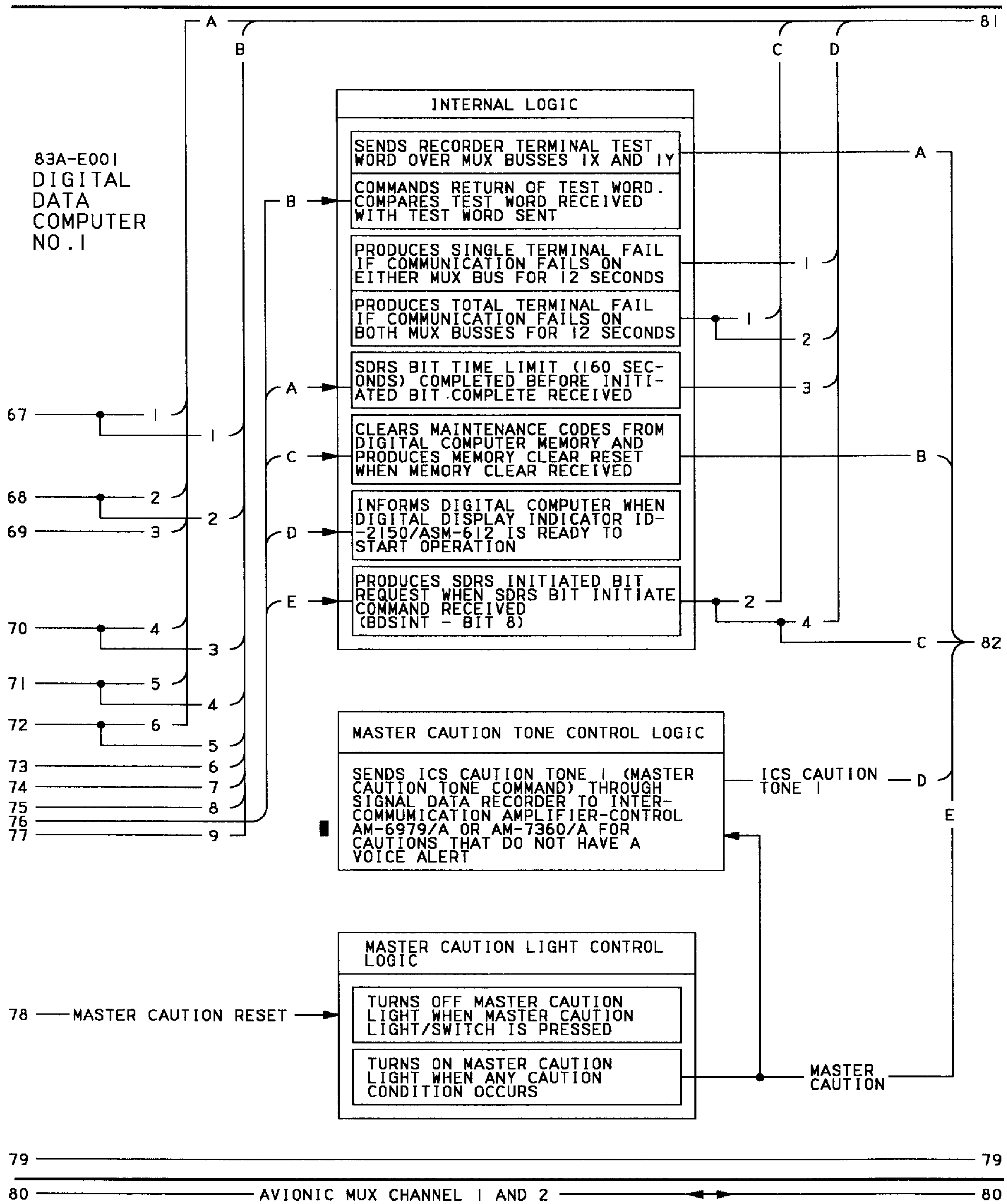


Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 7)



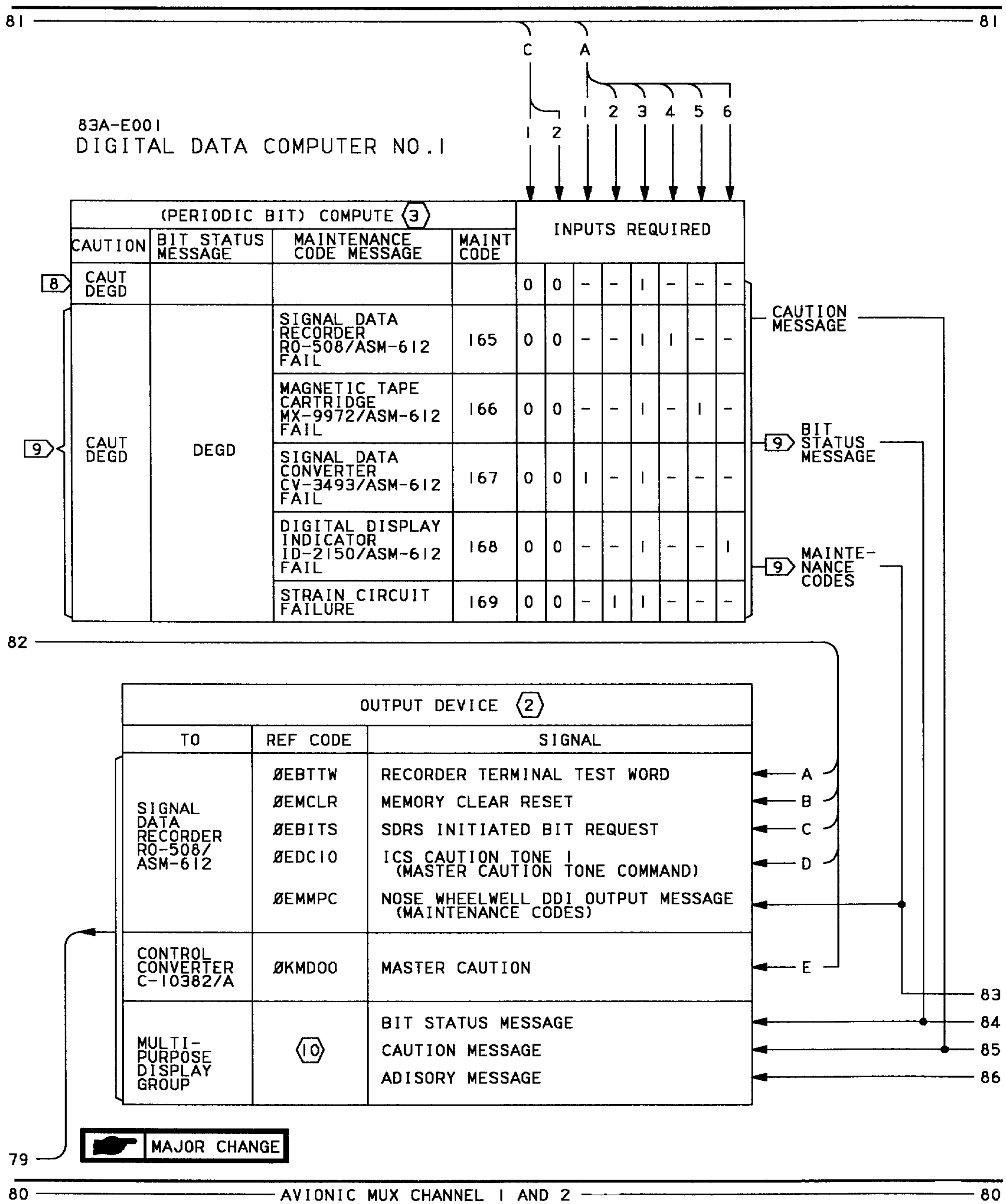
18AC-580-10-(8-8)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 8)



18AC-580-10-(8-9)13-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 9)



18AC-580-10-(8-10)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 10)

81 — D — B

83A-E001
DIGITAL DATA COMPUTER NO. 1

(INITIATED BIT) COMPUTE 3					INPUTS REQUIRED												
CAUTION	ADVISORY	BIT STATUS MESSAGE	MAINTENANCE CODE MESSAGE	MAINT CODE	D 1	D 2	D 3	D 4	B 1	B 2	B 3	B 4	B 5	B 6	B 7	B 8	B 9
			SIGNAL DATA RECORDER RO-508/ASM-612 TERMINAL FAIL (SINGLE)	030	1	–	–	–	–	–	–	–	–	–	–	–	1
CAUT DEGD	BIT	NO GO	SIGNAL DATA RECORDER RO-508/ASM-612 TERMINAL FAIL (TOTAL)	030	–	1	–	–	–	–	–	–	–	–	–	–	1
		NOT RDY			–	1	–	–	–	–	–	–	–	–	–	–	0
		RESTRT			–	0	1	–	–	–	–	–	–	1	–	0	–
					–	0	–	1	–	–	–	–	–	0	–	0	–
		IN TEST			–	0	–	1	–	–	–	–	–	1	–	0	–
		GO			–	0	–	1	–	–	–	–	–	0	0	1	–
CAUT DEGD	BIT	DEGD	SIGNAL DATA RECORDER RO-508/ASM-612 FAIL	165	–	0	–	1	–	–	1	–	–	–	–	–	–
			MAGNETIC TAPE CARTRIDGE MX-9972/ASM-612 FAIL	166	–	0	–	1	–	–	–	1	–	–	–	–	–
CAUT DEGD			SIGNAL DATA CONVERTER CV-3493/ASM-612 FAIL	167	–	0	–	1	1	–	–	–	–	–	–	–	–
			DIGITAL DISPLAY INDICATOR ID-2150/ASM-612 FAIL	168	–	0	–	1	–	–	–	–	1	–	–	–	–
			STRAIN CIRCUIT FAILURES	169	–	0	–	1	–	1	–	–	–	–	–	–	–

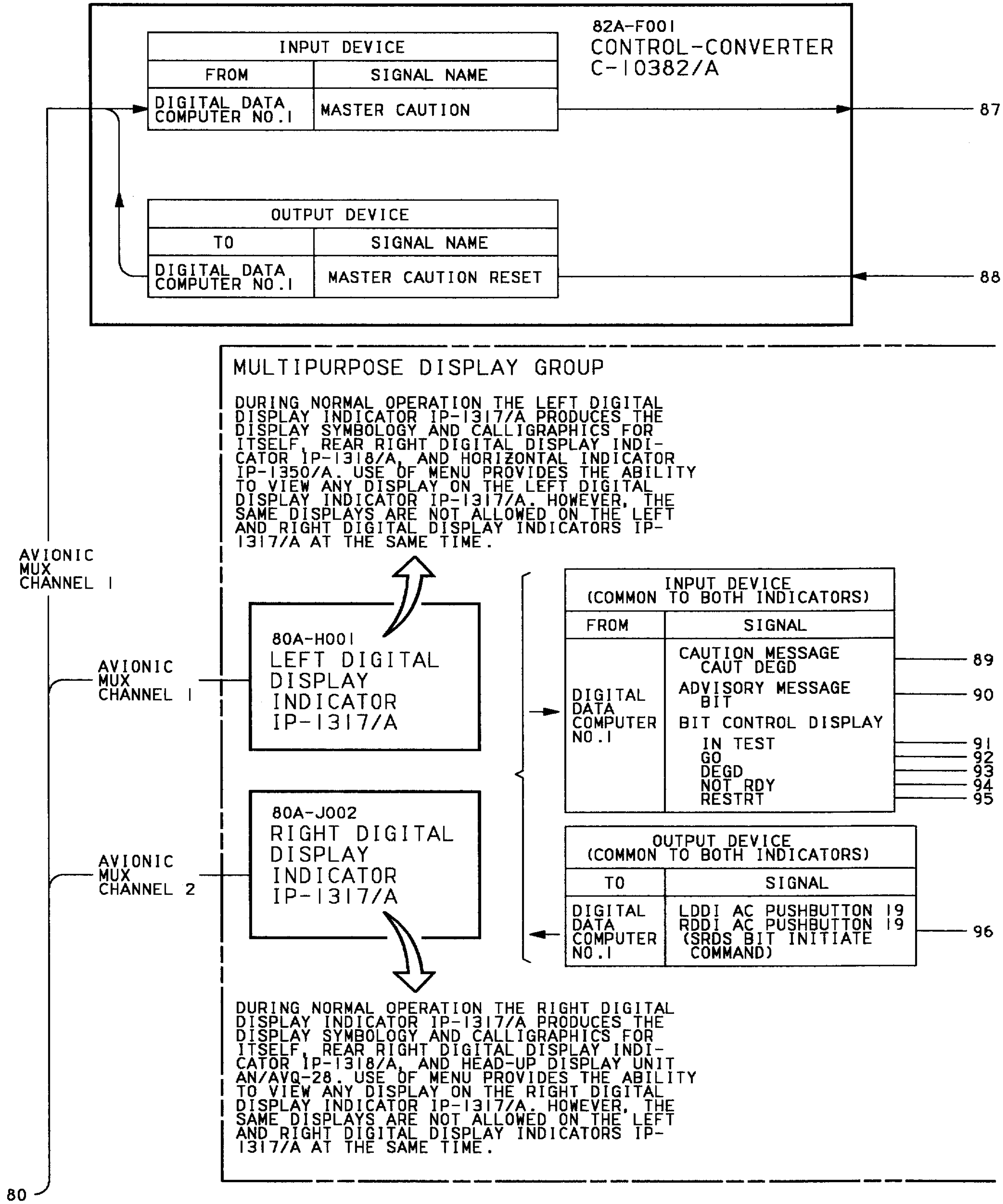
83 — MAINTENANCE CODES
84 — BIT STATUS MESSAGE
85 — CAUTION MESSAGE
86 — AVISORY MESSAGE

MAJOR CHANGE

80 — AVIONIC MUX CHANNEL 1 AND 2 — 80

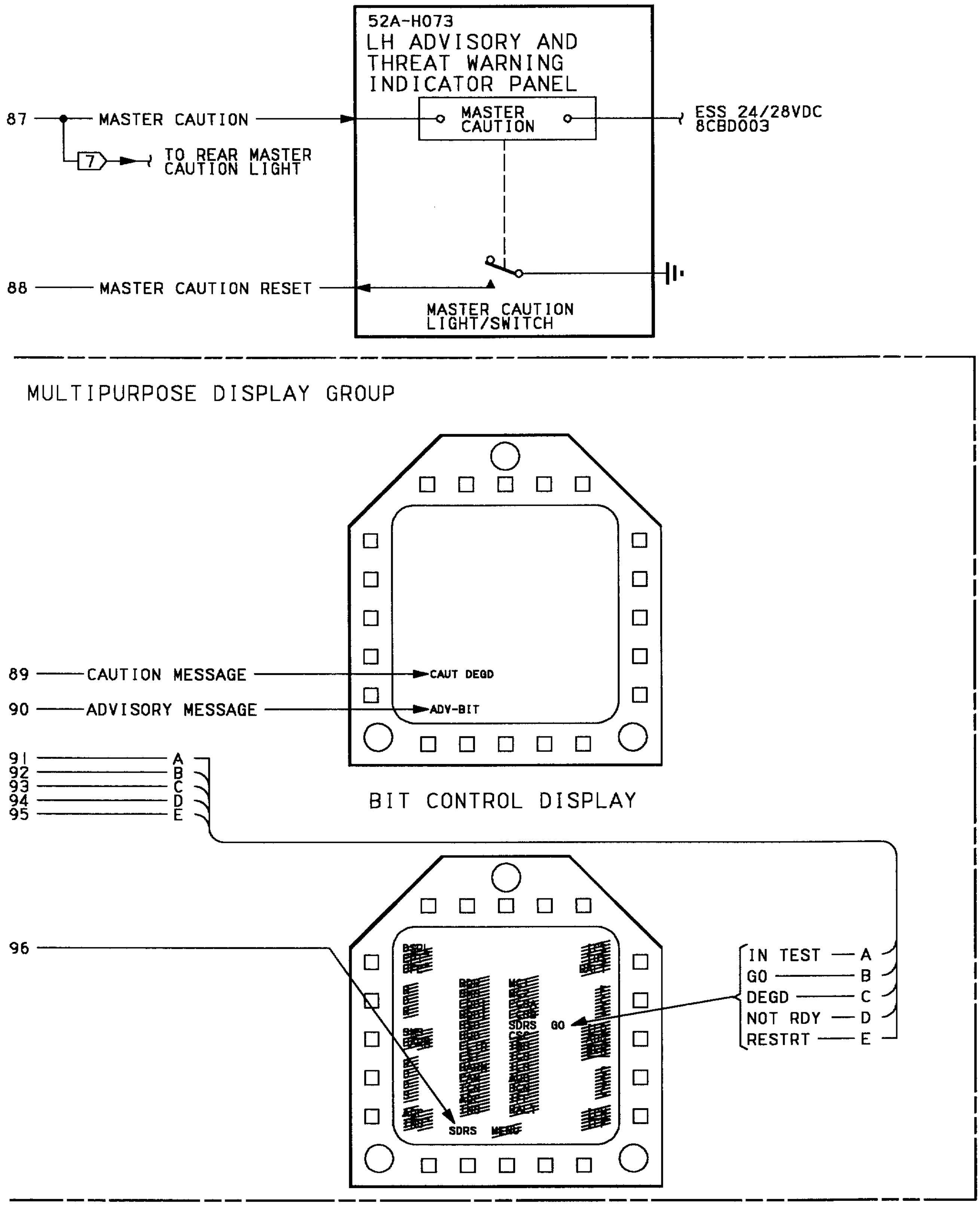
18AC-580-10-(8-11)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 11)



18AC-580-10-(8-12)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 12)



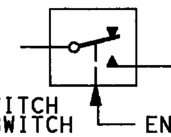
18AC-580-10-(8-13)E-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 13)

LEGEND

1. NONSTANDARD SYMBOLS:

 TELELIGHT



2 FOR LOGIC DIAGRAMS RELATING TO REF CODE, REFER TO A1-F18AC-OLD-000.

3 EXPLANATION OF MATRIX:

A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.

B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.

C. SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.

D. INTERPRET MATRIX TABLE AS SHOWN:

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.

(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.

(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

4 RECORD FUNCTION SIMPLIFIED SCHEMATIC, WP017 00.

5 SIMPLIFIED POWER SCHEMATIC, WP006 00.

6 FATIGUE STRAIN DATA SIMPLIFIED SCHEMATIC, WP012 00.

7 F/A-18B.

8 WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 210.

9 WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 85A AND UP.

10 DISPLAY REF CODES ARE NOT SHOWN. IF DISPLAY MALFUNCTION EXISTS, TRANSFER DISPLAY TO ANOTHER INDICATOR. IF MALFUNCTION EXISTS ON MORE THAN ONE INDICATOR, TROUBLESHOOT USING A1-F18AC-OLD-000 INPUT REF CODES. IF MALFUNCTION EXISTS ONLY ON ONE INDICATOR, TROUBLESHOOT BY DOING DISPLAY TEST, A1-F18AC-745-200, WP004 00 (F/A-18A) OR WP005 00 (F/A-18B).

18AC-580-10-(8-14)13-GRID

Figure 1. Signal Data Recording Set AN/ASM-612 Built-In Test Simplified Schematic (Sheet 14)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - RECORD FUNCTION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

This WP supersedes WP017 00, dated 15 May 1985.

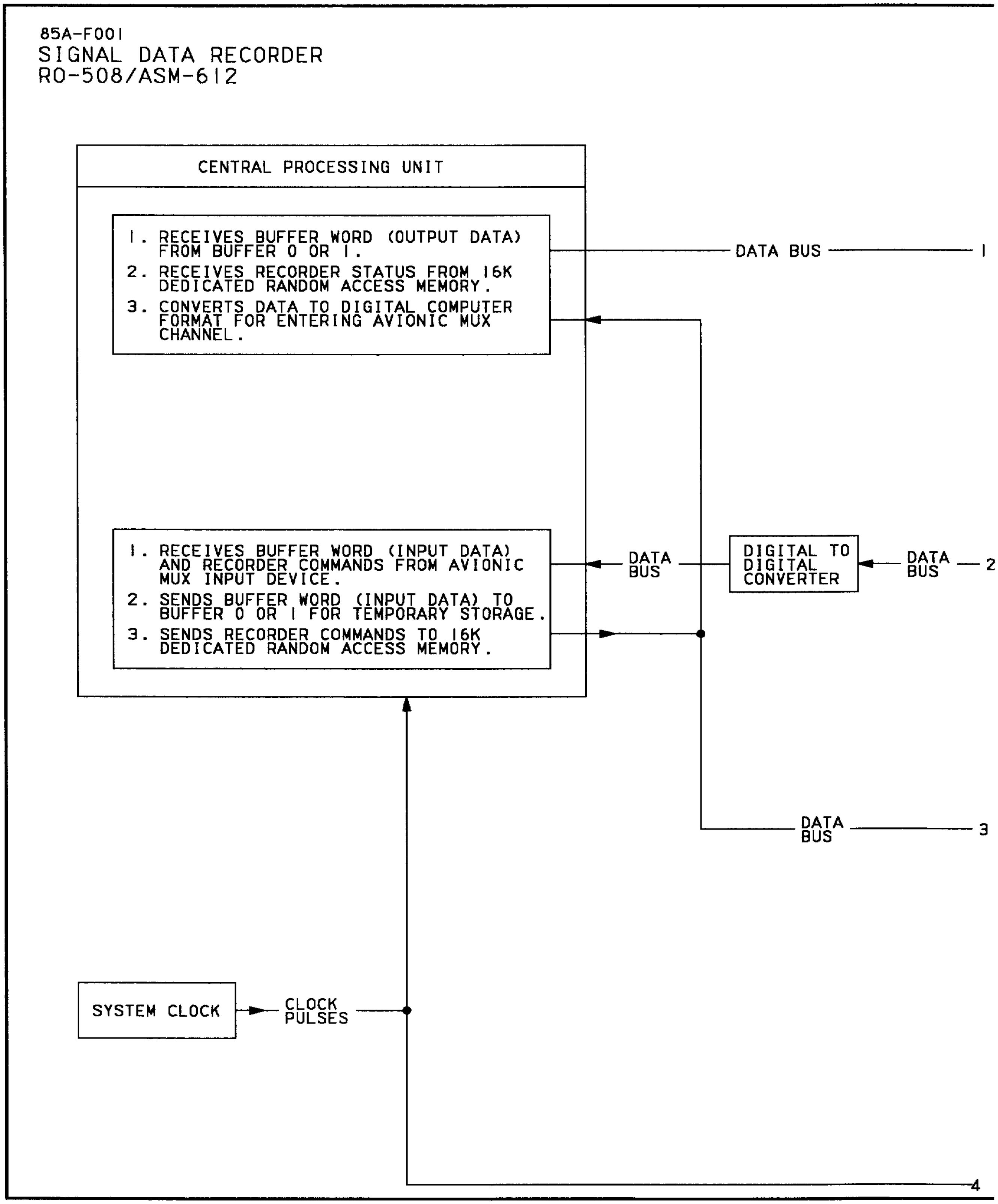
Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None



18AC-580-10-(18-1)-GRID

Figure 1. Record Function Simplified Schematic (Sheet 1)

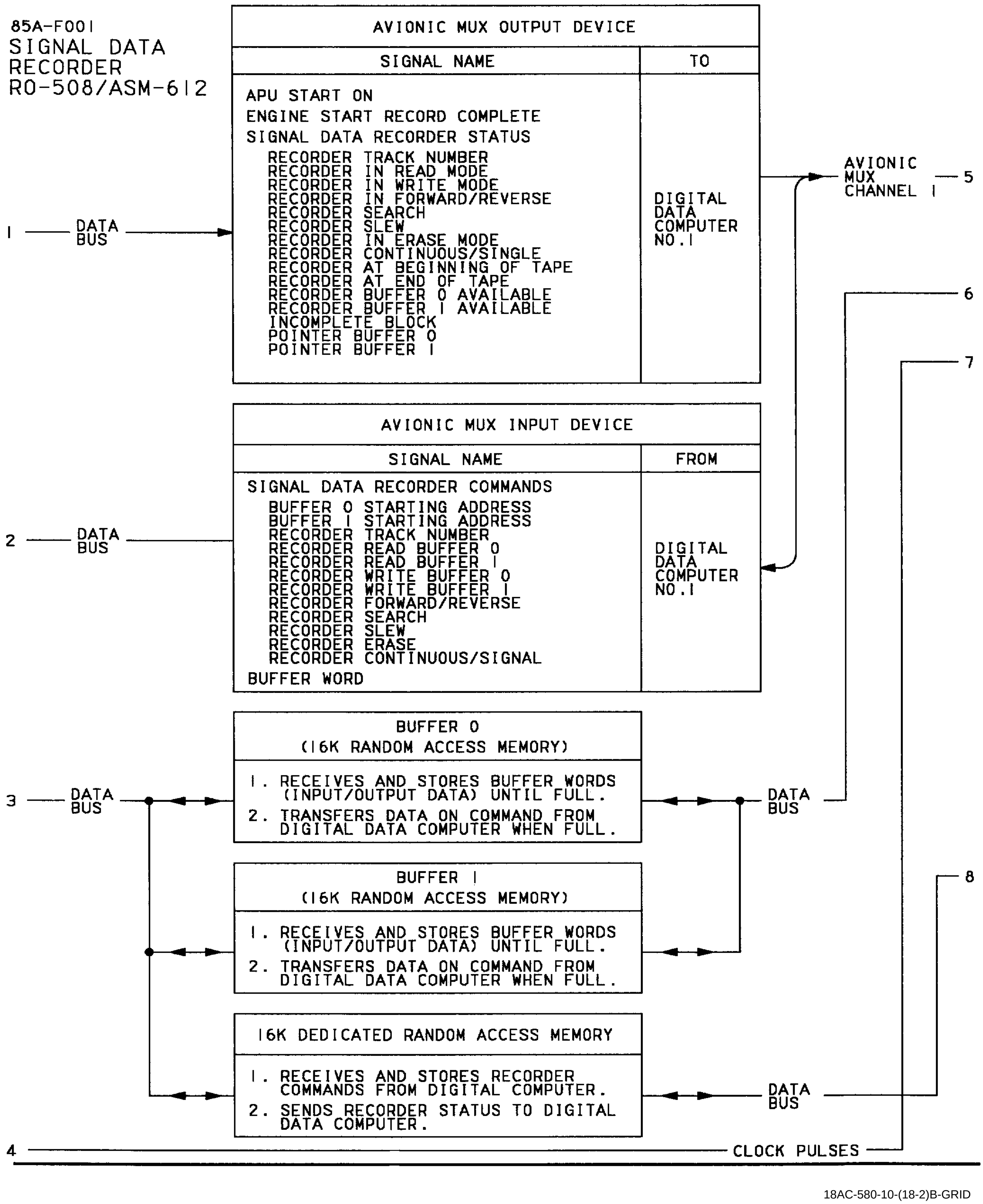
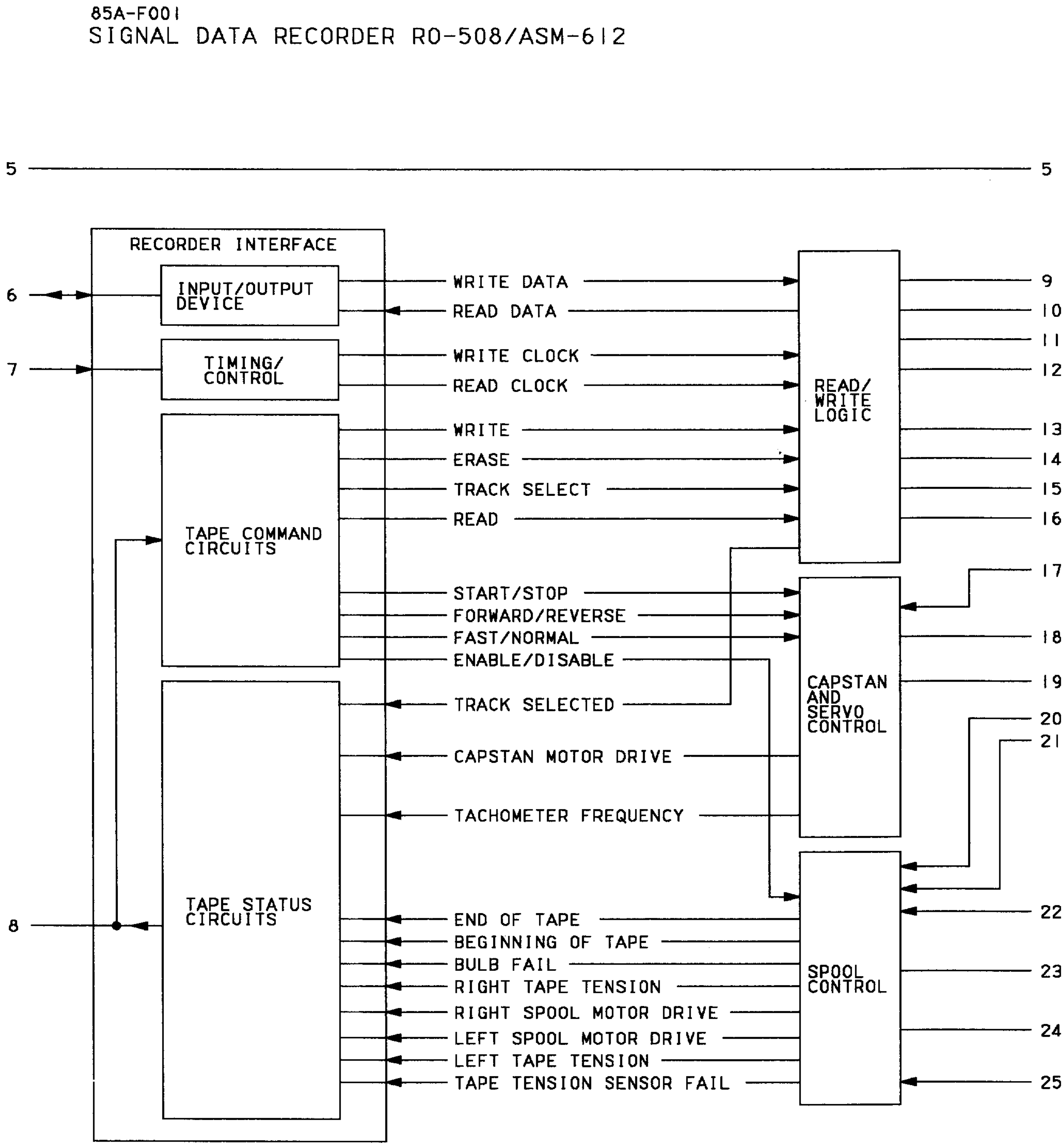
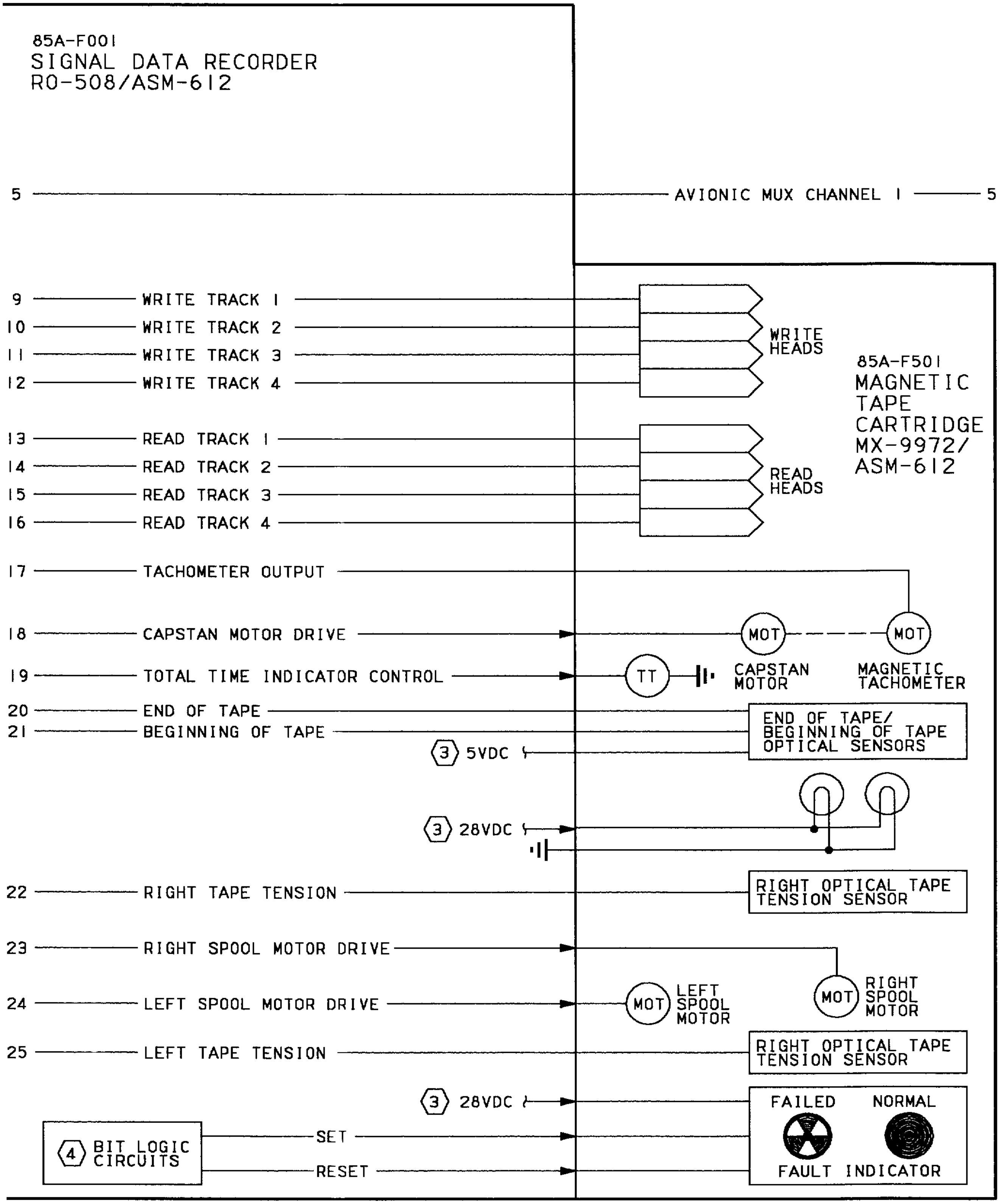


Figure 1. Record Function Simplified Schematic (Sheet 2)



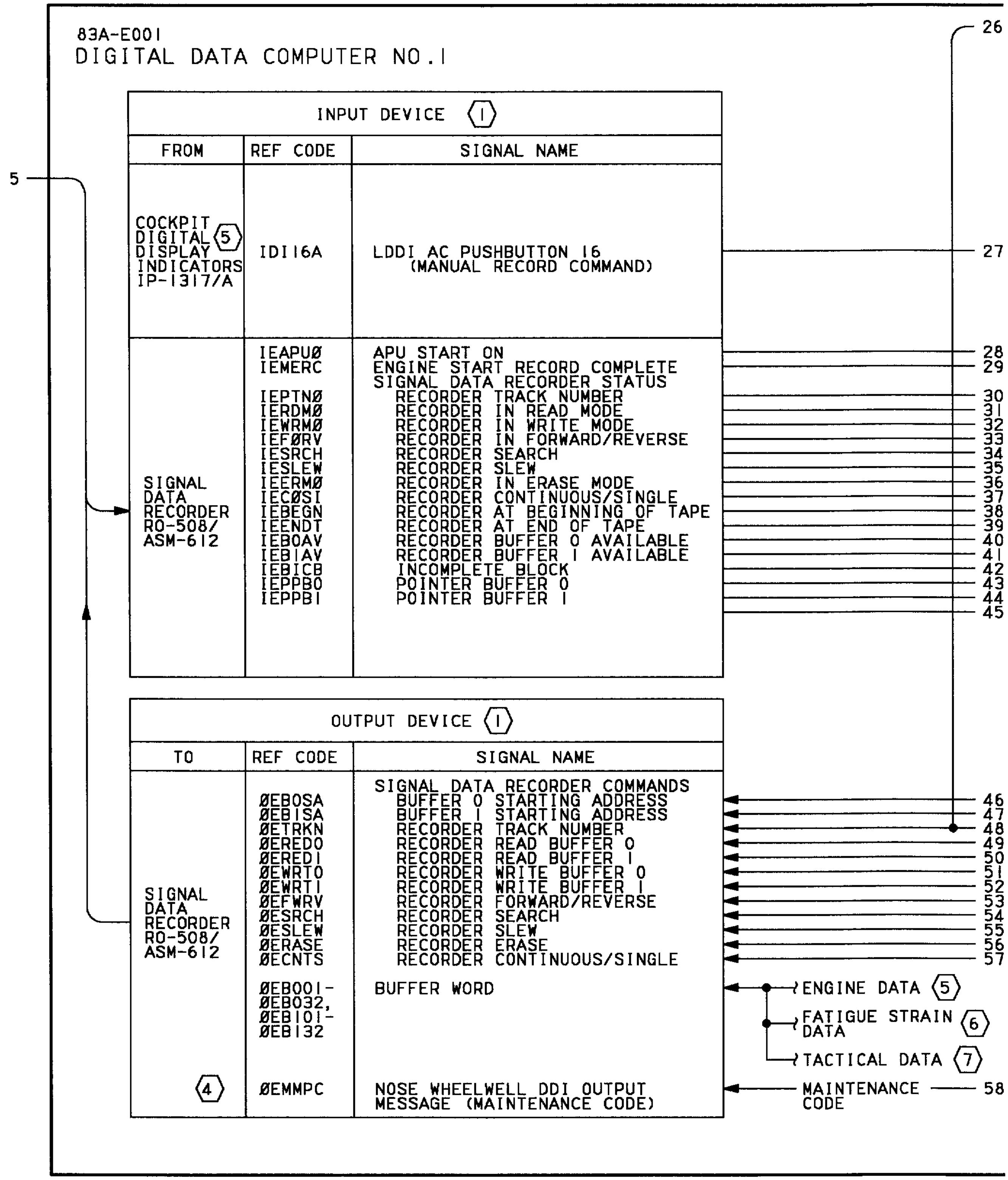
18AC-580-10-(18-3)-GRID

Figure 1. Record Function Simplified Schematic (Sheet 3)



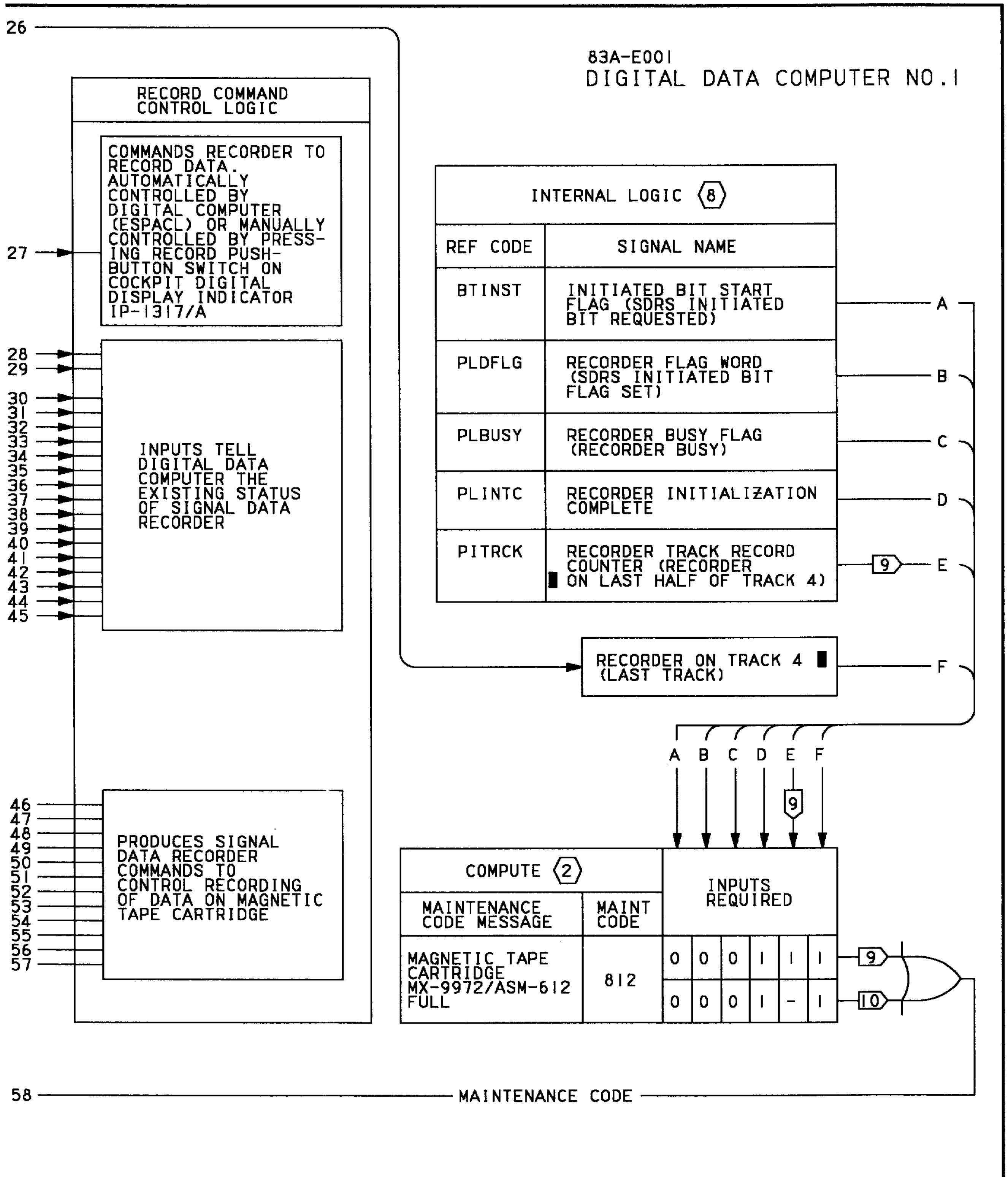
18AC-580-10-(18-4)B-GRID

Figure 1. Record Function Simplified Schematic (Sheet 4)



18AC-580-10-(18-5)B-GRID

Figure 1. Record Function Simplified Schematic (Sheet 5)



18AC-580-10-(18-6)15-GRID

Figure 1. Record Function Simplified Schematic (Sheet 6)

LEGEND

⟨1⟩ FOR LOGIC DIAGRAMS RELATING TO REF CODE, REFER TO A1-F18AC-OLD-000.

⟨2⟩ EXPLANATION OF MATRIX

A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.

B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.

C. SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.

D. INTERPRET MATRIX TABLE AS INDICATED.

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.

(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.

(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

⟨3⟩ SIMPLIFIED POWER SCHEMATIC, WP006 00.

⟨4⟩ SIGNAL DATA RECORDING SET BUILT-IN TEST SIMPLIFIED SCHEMATIC, WP016 00.

⟨5⟩ LEFT ENGINE AND RIGHT ENGINE INTERFACE SIMPLIFIED SCHEMATICS, WP009 00 AND WP010 00.

⟨6⟩ FATIGUE STRAIN DATA SIMPLIFIED SCHEMATIC, WP012 00.

⟨7⟩ FOR LIST OF ALL TACTICAL DATA RECORDED, SEE WP005 00.

⟨8⟩ REF CODES USED FOR THESE COMPUTATIONS ARE MISSION COMPUTER INTERNAL MNEMONICS. TO LOCATE INTERNAL REF CODES IN A1-F18AC-OLD-000, USE THE LOGIC DIAGRAMS FOR THE INPUT/OUTPUT REF CODES.

⟨9⟩ WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 210.

⟨10⟩ WITH DIGITAL DATA COMPUTER NO.1 CONFIG/IDENT NUMBER 84A AND UP.

18AC-580-10-(18-7)B-GRID

Figure 1. Record Function Simplified Schematic (Sheet 7)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - ENVIRONMENTAL CONTROL SYSTEMS INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

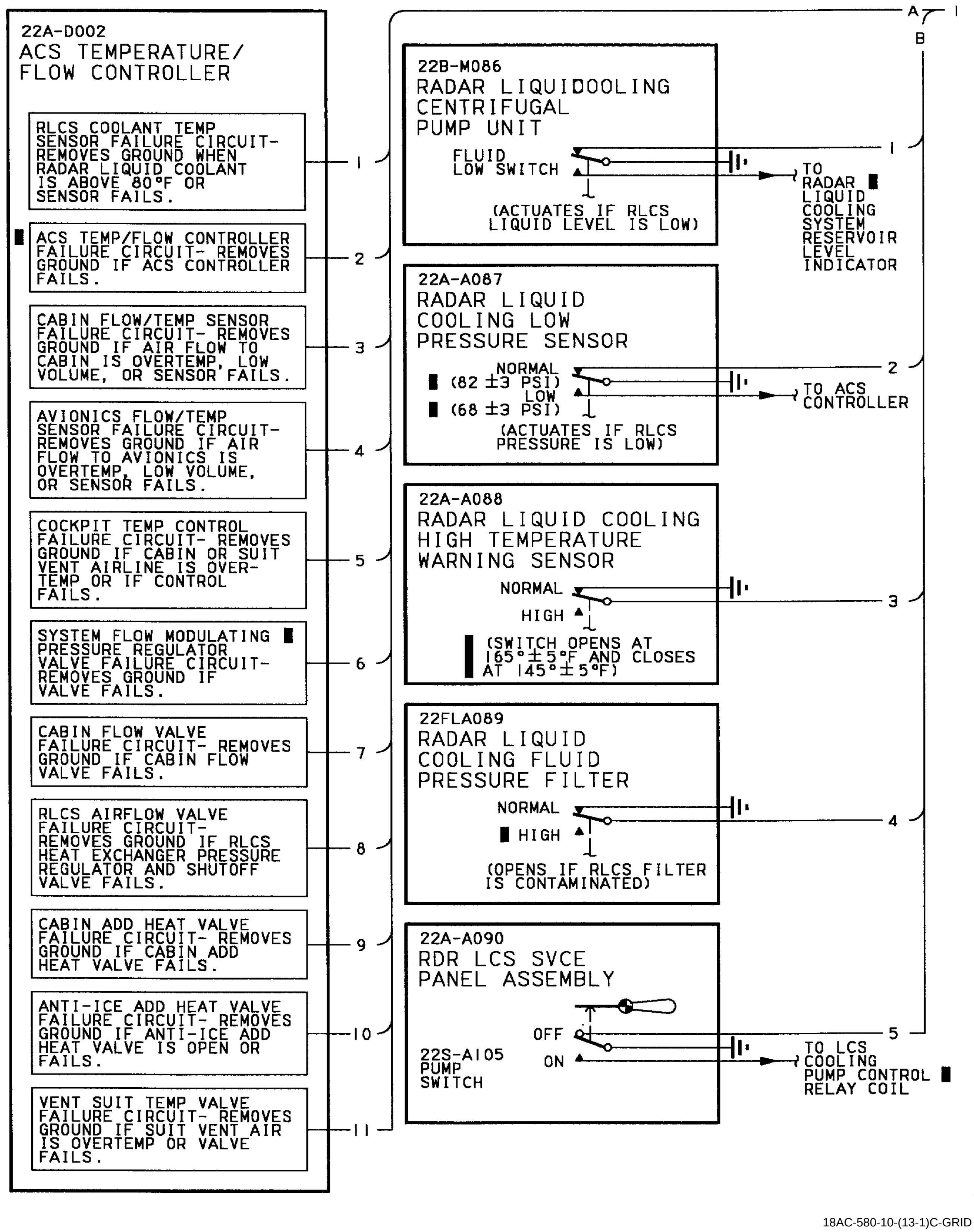
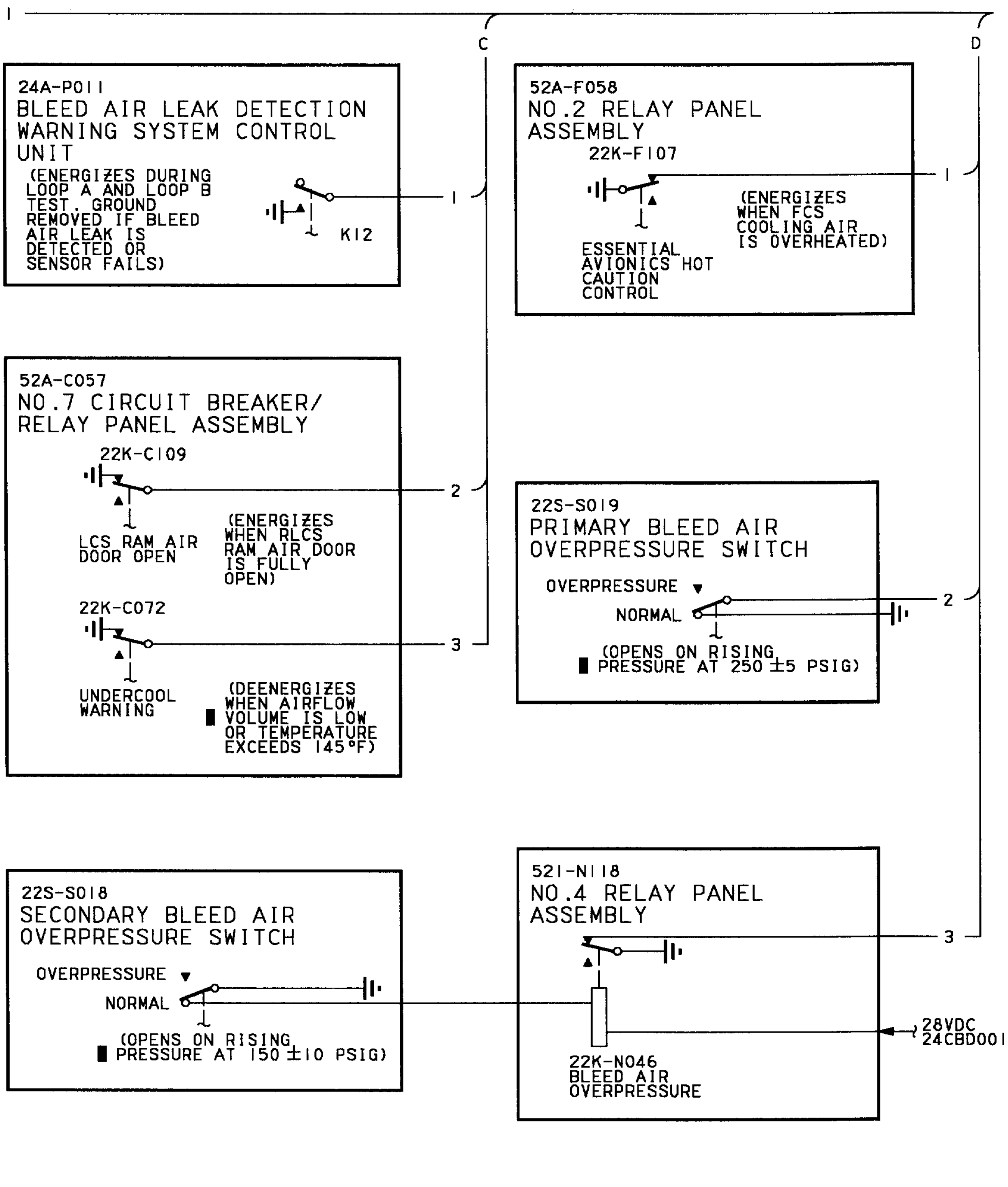
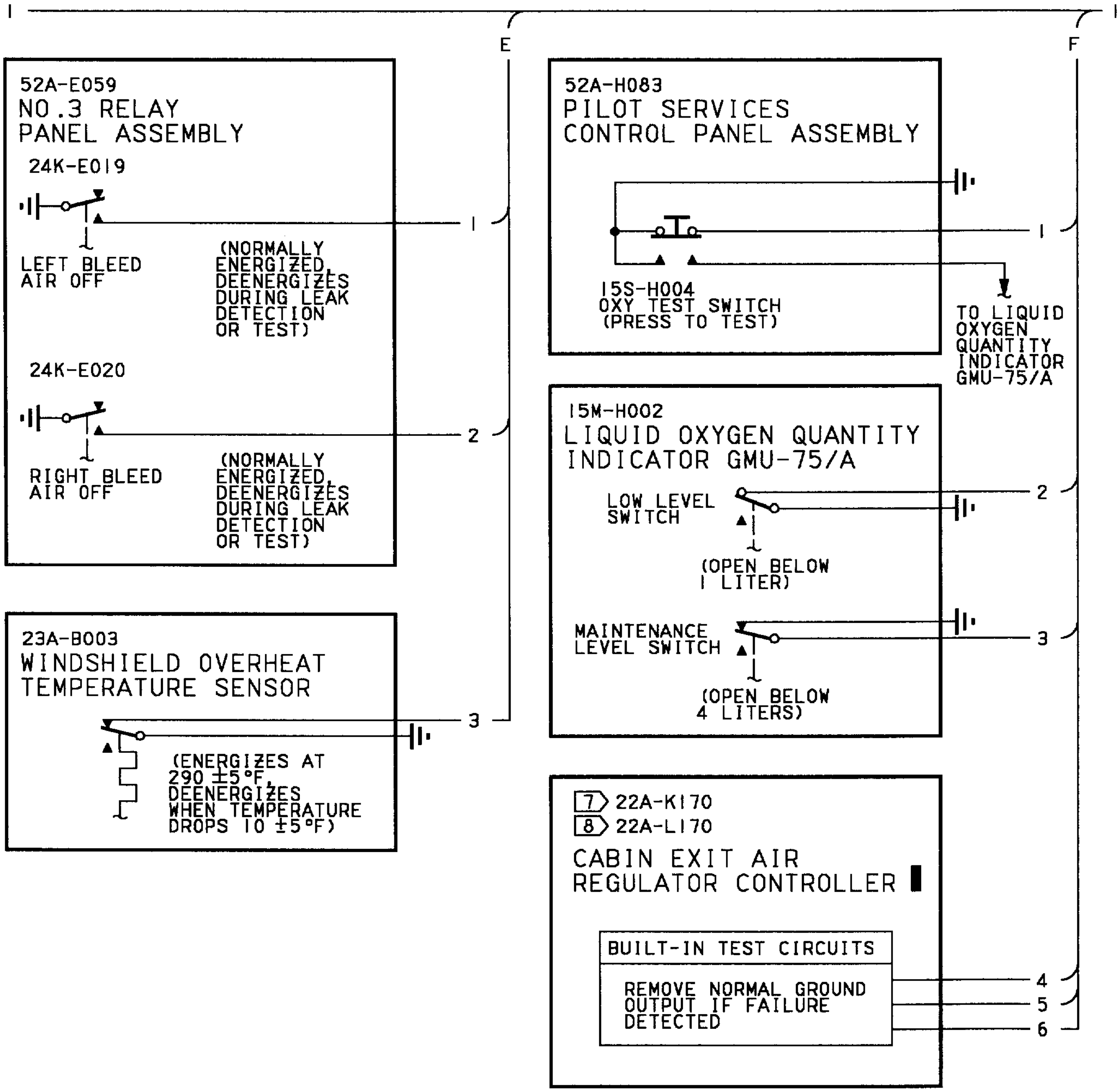


Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 1)



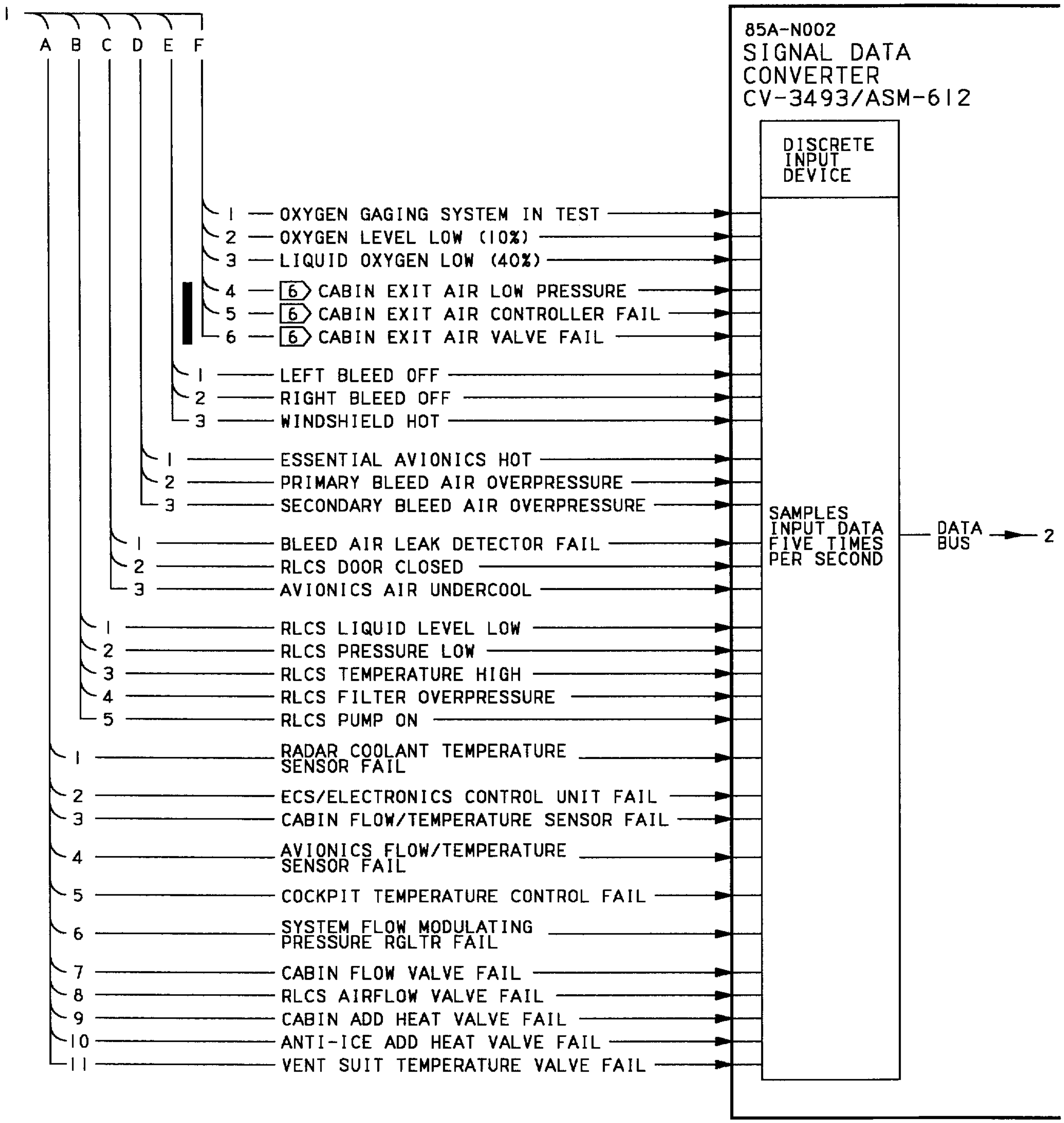
18AC-580-10-(13-2)C-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 2)



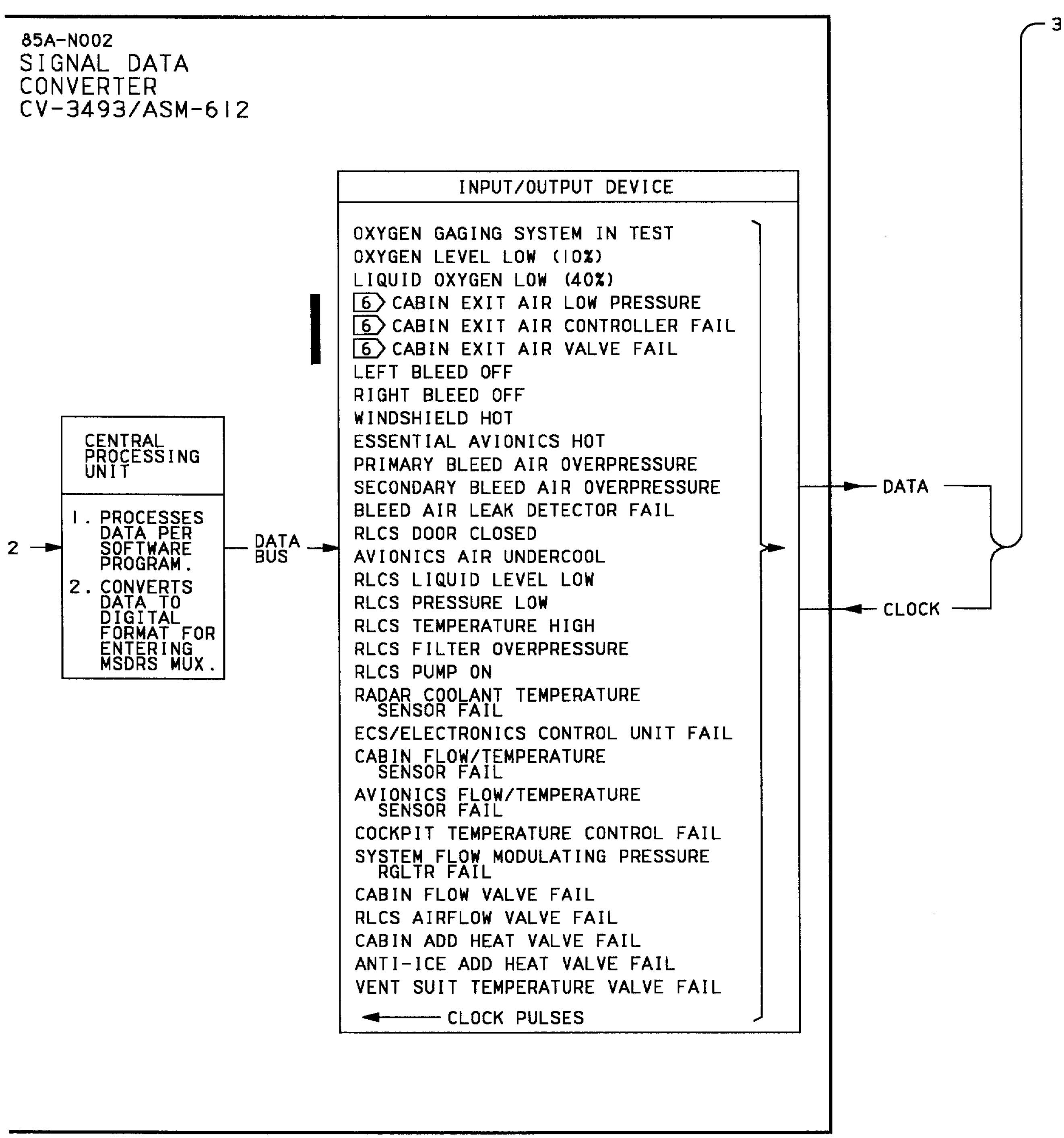
18AC-580-10-(13-3)13-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 3)



18AC-580-10-(13-4)D-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 4)



18AC-580-10-(13-5)D-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 5)

3 — 100 KHZ MSDRS MUX — 3

85A-G003
DIGITAL DISPLAY INDICATOR
ID-2150/ASM-612

ELECTRICALLY ALTERABLE READ ONLY MEMORY - RECEIVES AND STORES MAINTENANCE CODES FOR DISPLAY

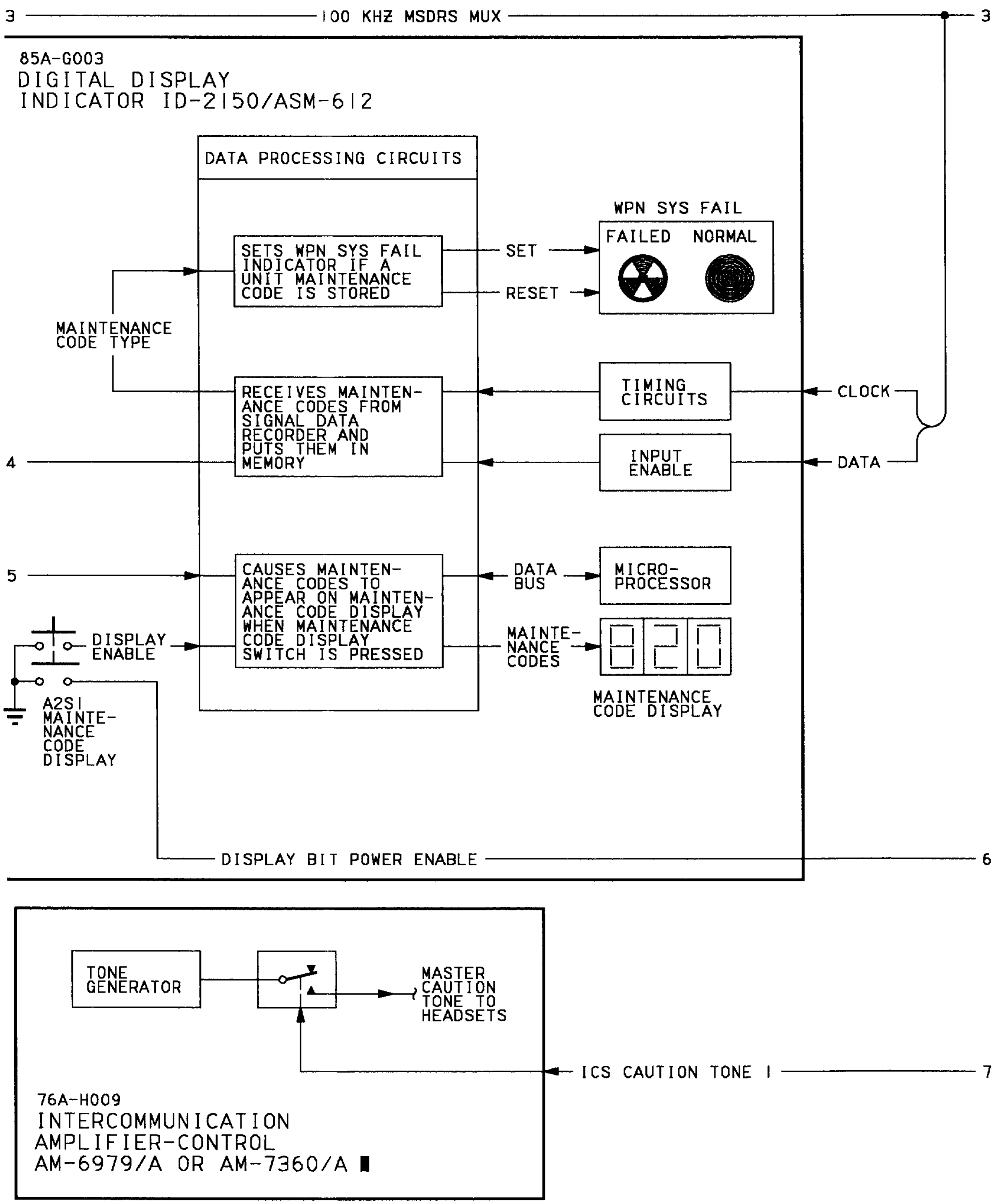
	MAINT CODE	MAINTENANCE CODE MESSAGE
	820	ACS TEMPERATURE/FLOW CONTROLLER (ITEM 29) FAIL
	821	CABIN AIRFLOW/TEMPERATURE SENSOR (ITEM 32) FAIL
	822	AVIONICS AIRFLOW/TEMPERATURE SENSOR (ITEM 58) FAIL
	823	SUIT/CABIN TEMPERATURE CONTROL (ITEM 80) FAIL
	824	SYSTEM SUPPLY AIRFLOW INCORRECT
	825	CABIN AIRFLOW INCORRECT
	826	ECS AIR FLOW TO RADAR LIQUID COOLING AIR FLOW VALVE (ITEM 12) FAIL
	827	CABIN TEMPERATURE INCORRECT
	828	RADAR LIQUID COOLANT TEMPERATURE SENSOR (ITEM 49) FAIL
	829	ECS DELIVERY AIR TEMPERATURE INCORRECT
	830	VENT SUIT TEMPERATURE SENSOR (ITEM 54) FAIL
	831	BLEED AIR LEAK OR BLEED AIR LEAK DETECTION FAIL
	832	PRIMARY BLEED AIR OVERPRESSURE
	833	SECONDARY BLEED AIR OVERPRESSURE
	840	RADAR LIQUID COOLING SYSTEM FILTER OVERPRESSURE
	841	RADAR LIQUID COOLING SYSTEM PRESSURE LOW
	842	RADAR LIQUID COOLING SYSTEM HEAT EXCHANGER OR FAN FAIL
	843	RADAR LIQUID COOLING SYSTEM DOOR OPERATION FAIL
	844	RADAR LIQUID COOLING SYSTEM TEMPERATURE HIGH
6	845	CABIN EXIT AIR CONTROLLER FAIL
6	846	CABIN EXIT AIR VALVE FAIL
6	847	CABIN EXIT AIR LOW PRESSURE
	985	RADAR LIQUID COOLING SYSTEM LIQUID LEVEL LOW OR OVERFILLED 4
	996	LOX LOW (40%)

MAINTENANCE CODES — 4

MAINTENANCE CODES — 5

18AC-580-10-(13-6)13-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 6)



18AC-580-10-(13-7)13-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 7)

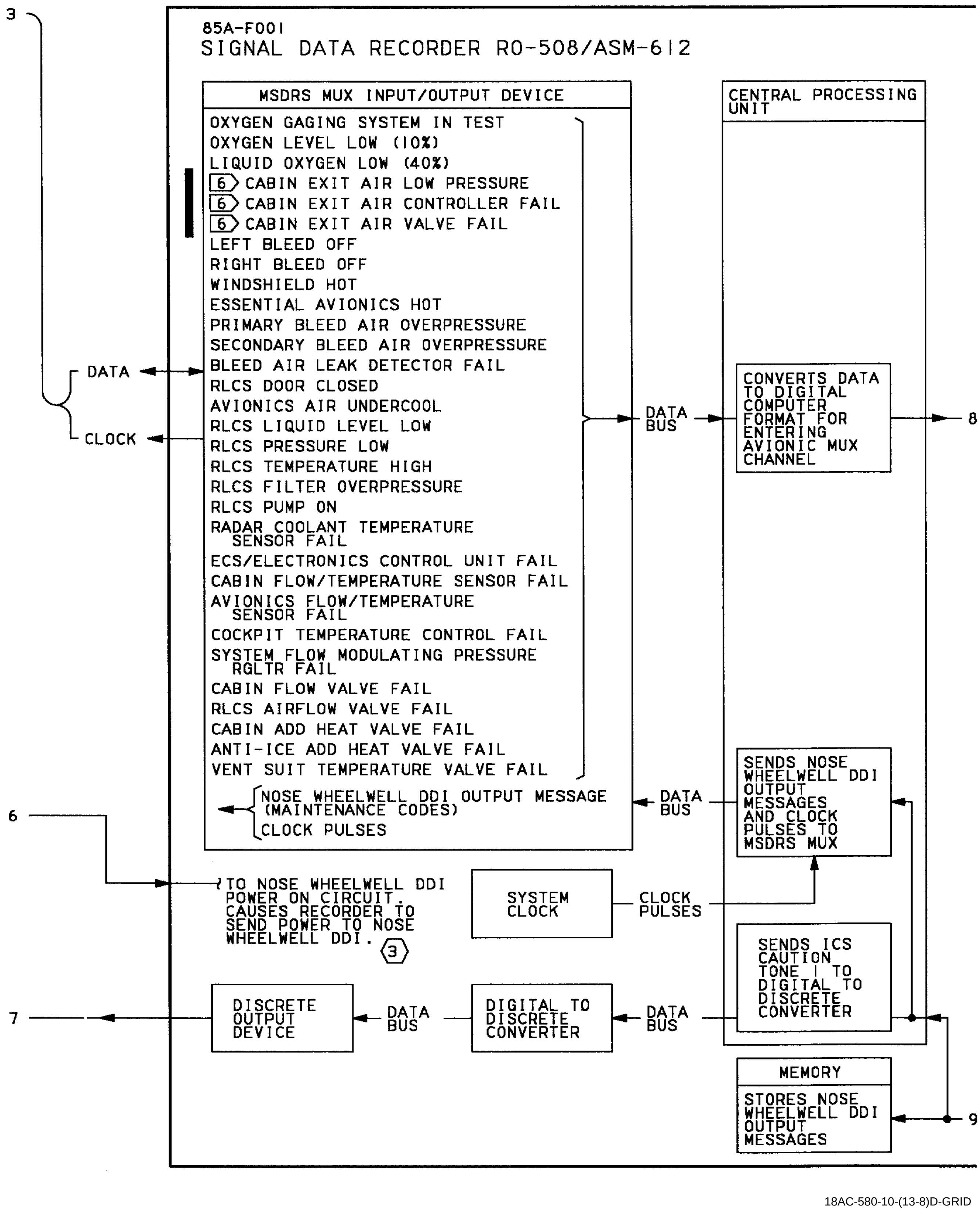
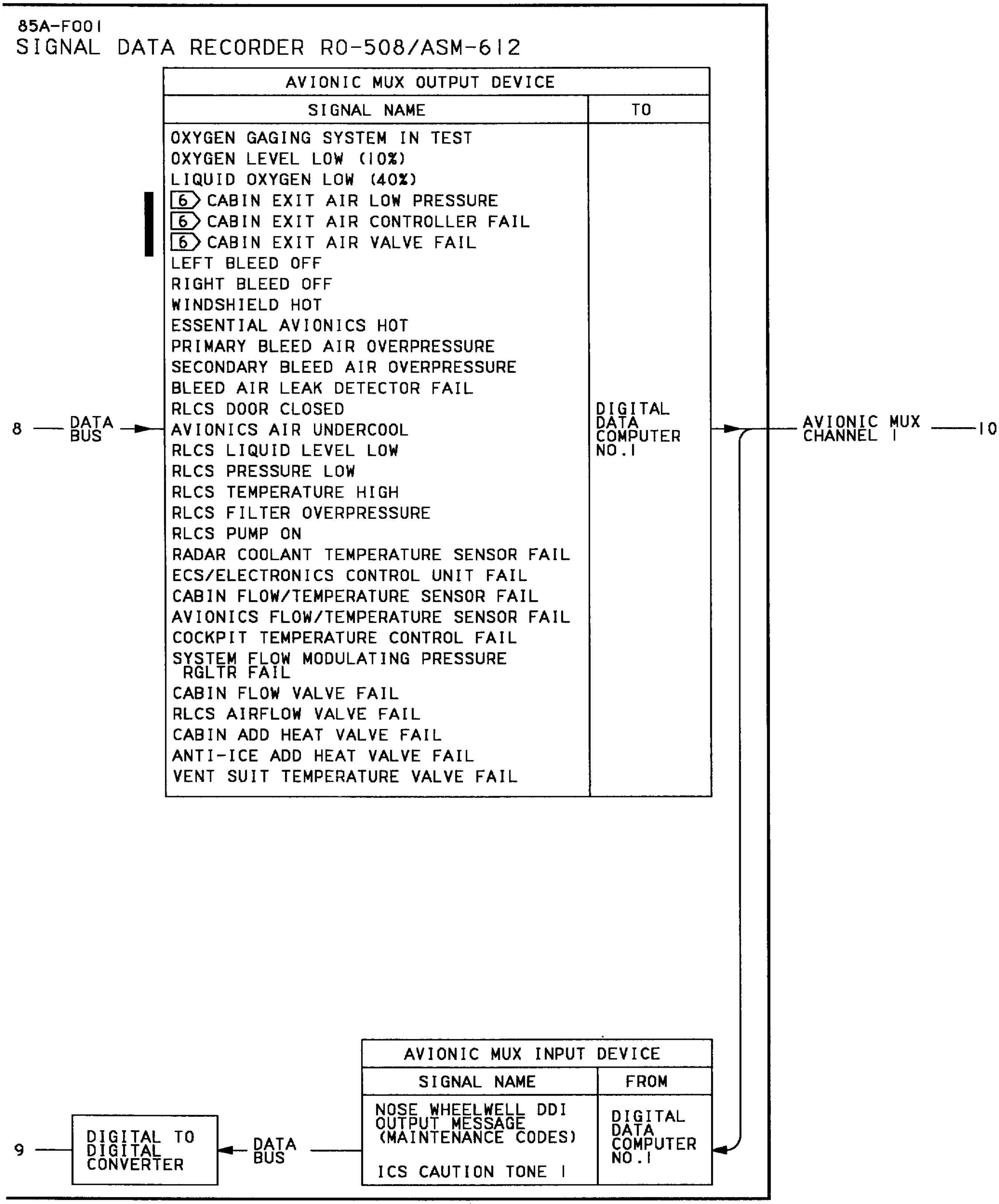
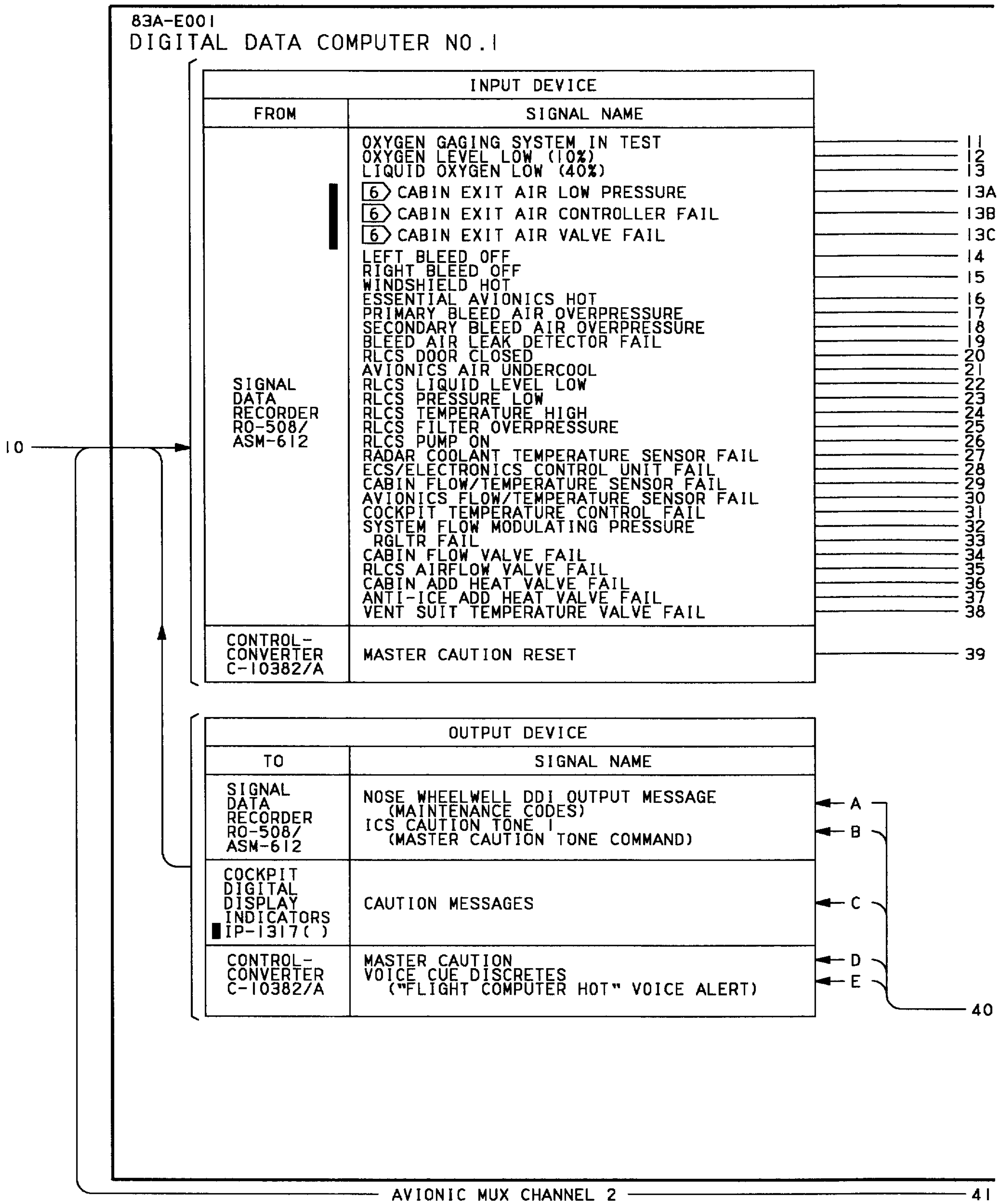


Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 8)



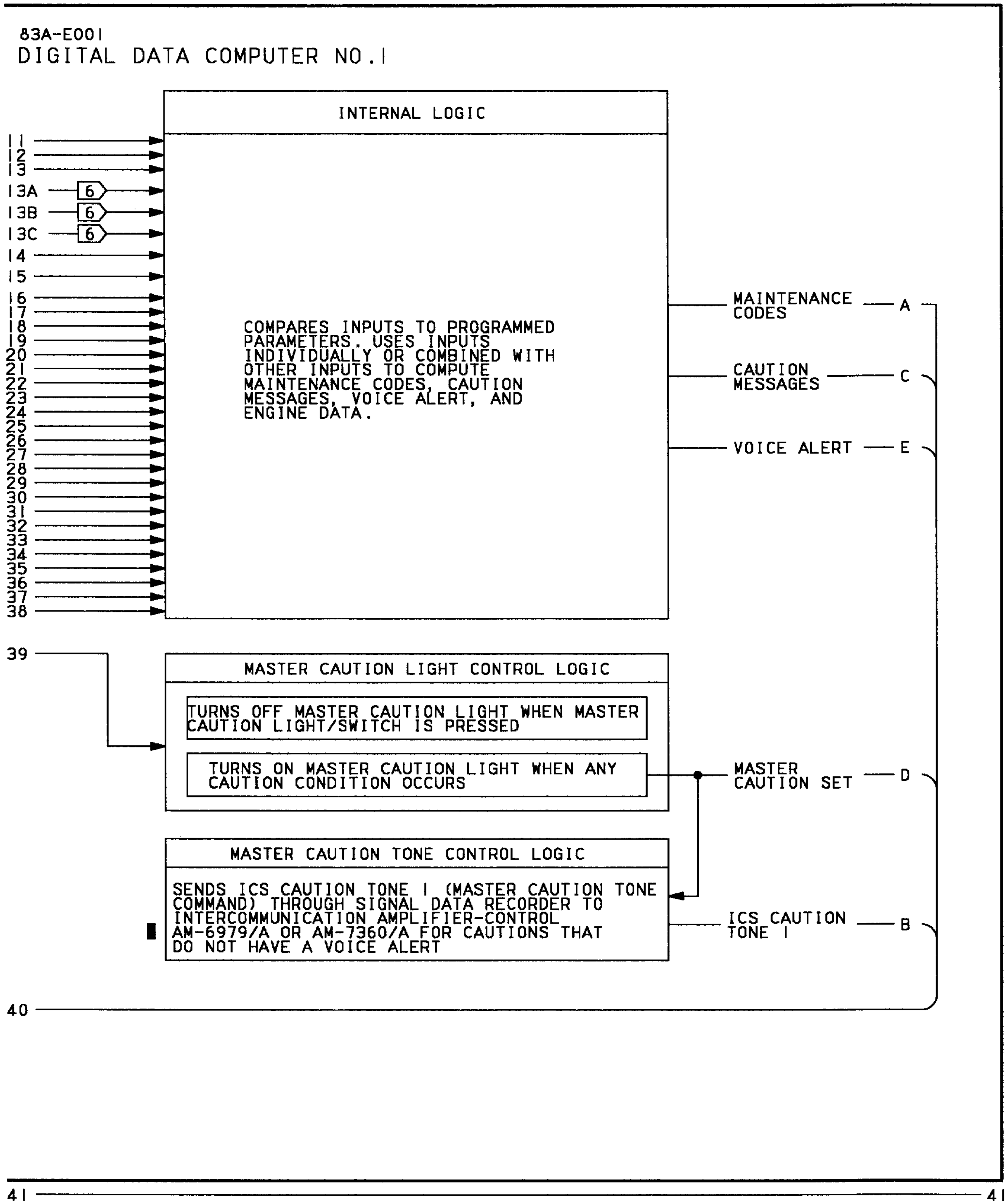
18AC-580-10-(13-9)D-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 9)



18AC-580-10-(13-10)D-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 10)



18AC-580-10-(13-11)13-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 11)

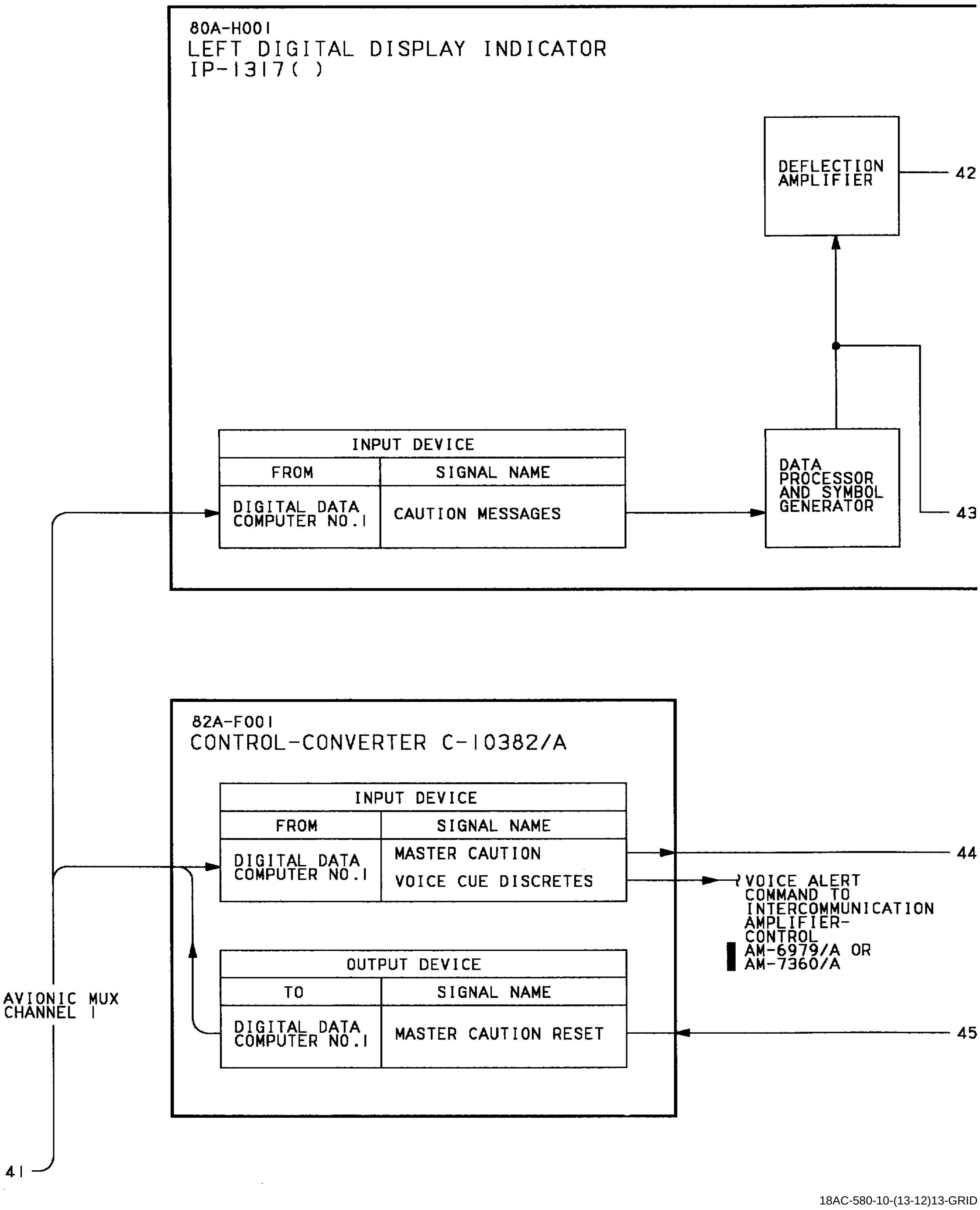
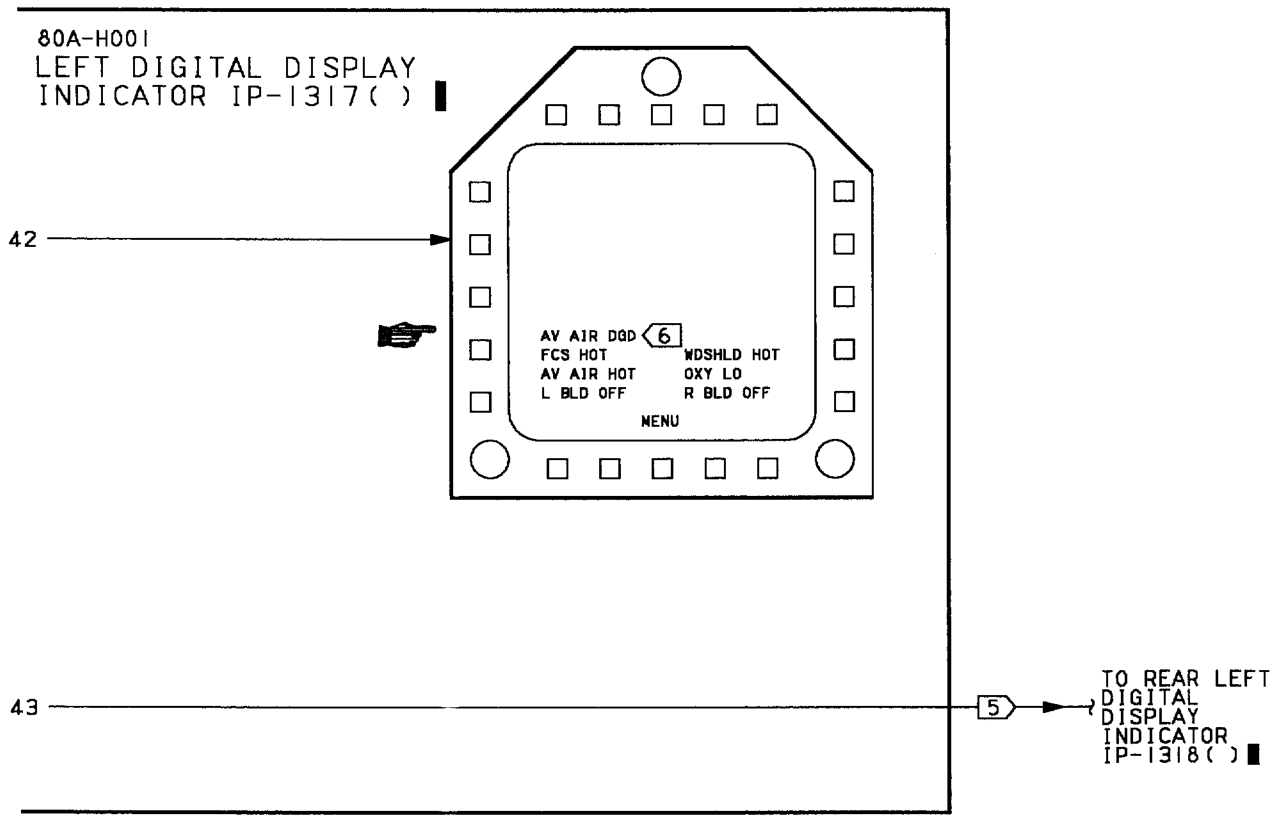
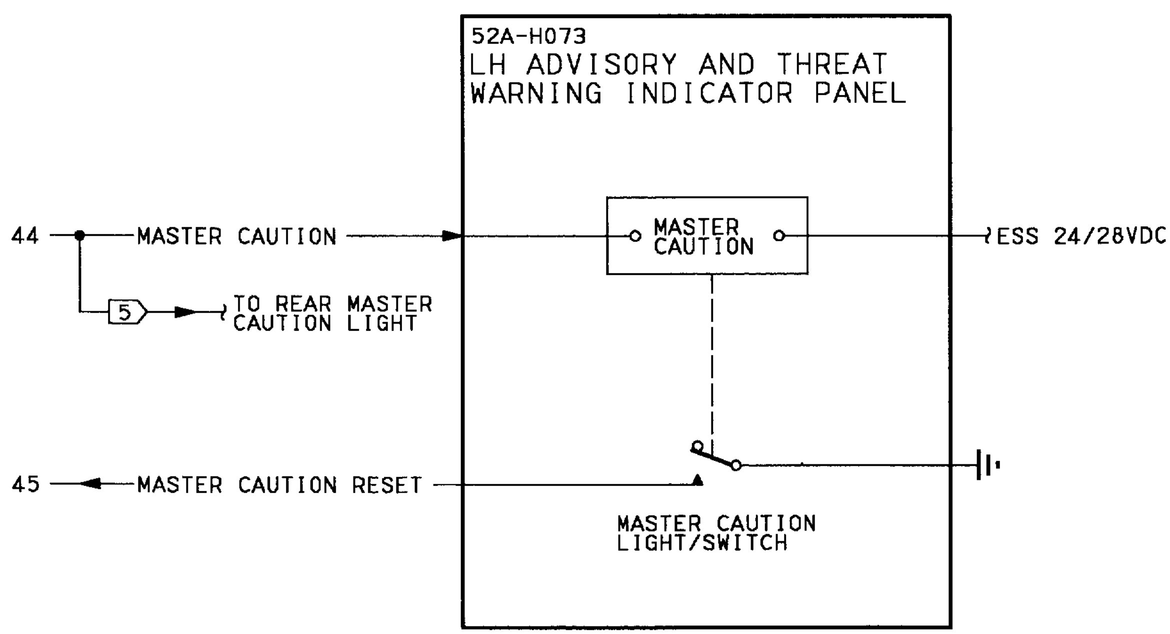


Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 12)



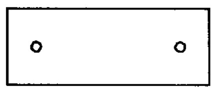


18AC-580-10-(13-13)D-GRID

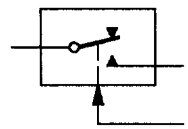
Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 13)

LEGEND

1. NONSTANDARD SYMBOLS


TELELIGHT

SOLID STATE ANALOG SWITCH


ENERGIZING SIGNAL

2 DELETED.

3 SIMPLIFIED POWER SCHEMATIC, WP006 00.

4 MAINTENANCE CODE 985 CAN ALSO BE DETECTED DURING TEST FOR FLUID LOW MAINTENANCE CODES. SEE DIGITAL DISPLAY INDICATOR ID-2150/ASM-612 SIMPLIFIED SCHEMATIC, WP014 00.

5 F/A-18B.

6 163092 AND UP.

7 F/A-18A 163092 AND UP.

8 F/A-18B 163104 AND UP.

18AC-580-10-(13-14)D-GRID

Figure 1. Environmental Control Systems Interface Simplified Schematic (Sheet 14)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - LANDING GEAR AND RELATED SYSTEMS INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

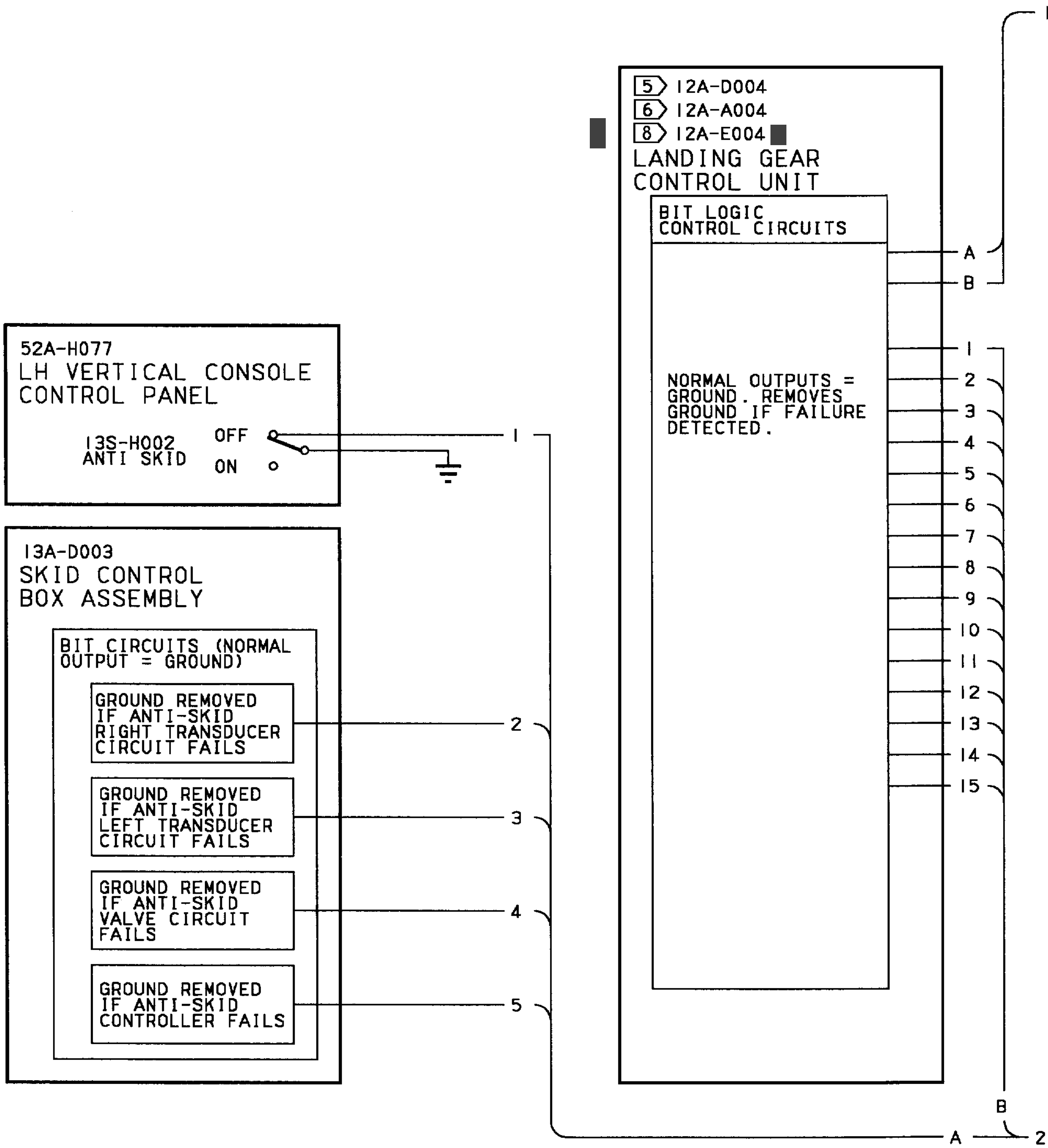
Reference Material

None

Alphabetical Index

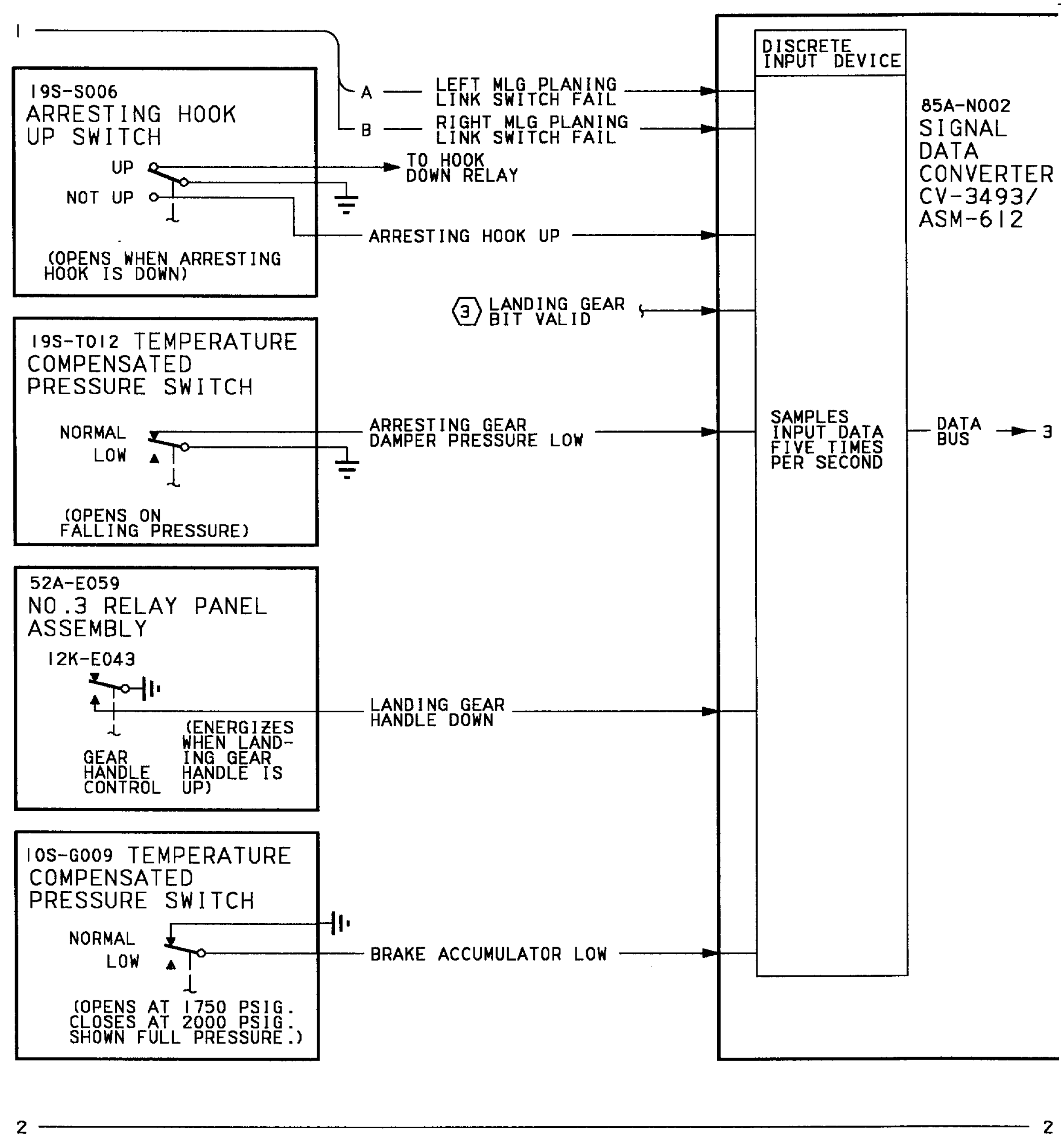
Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 48	-	Alternating Current Bus Isolation (ECP MDA-F/A-18-00121)	1 Sep 86	ECP coverage only
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-



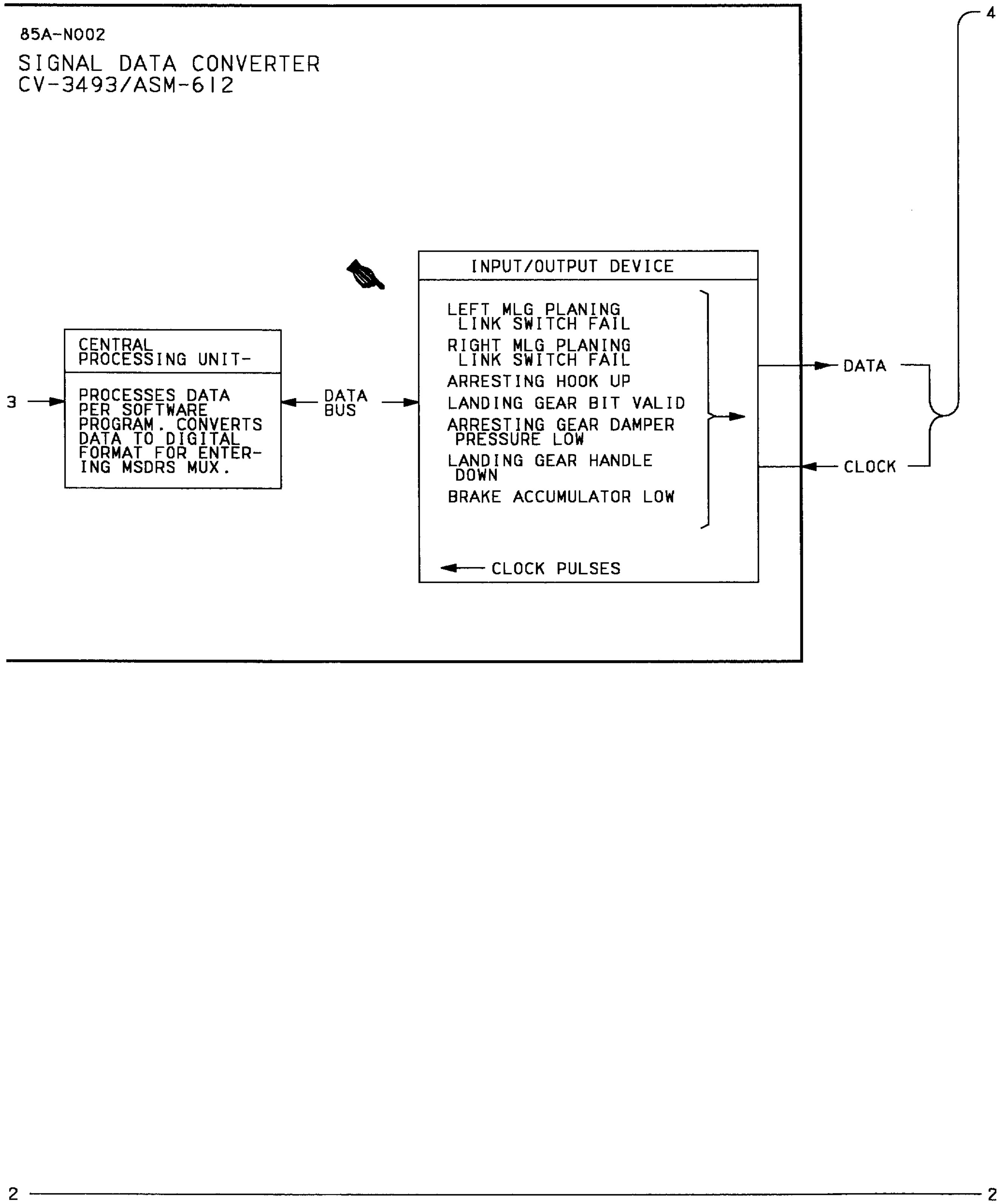
01900101

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 1)



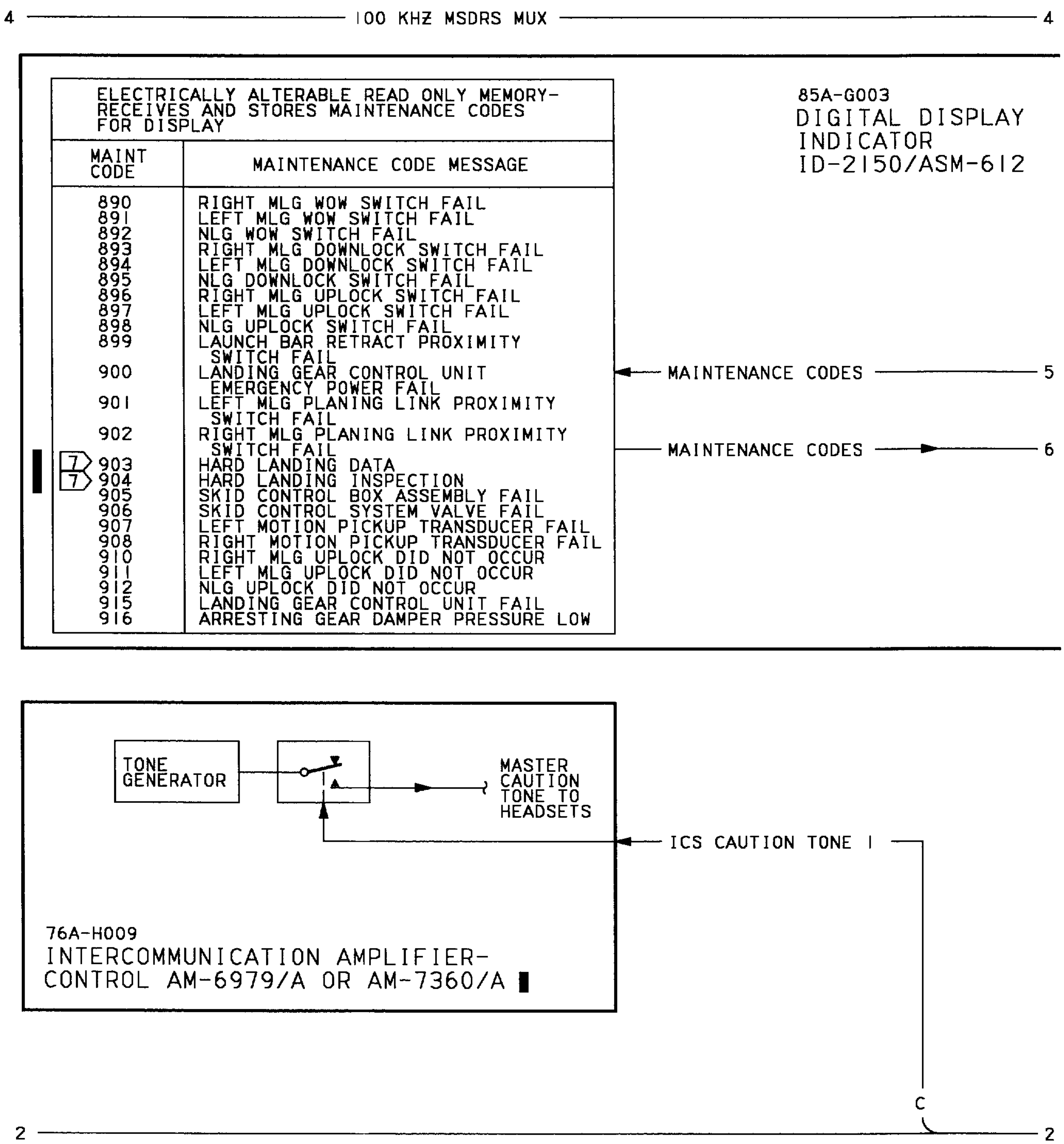
18AC-580-10-(14-2)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 2)



18AC-580-10-(14-3)C-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 3)

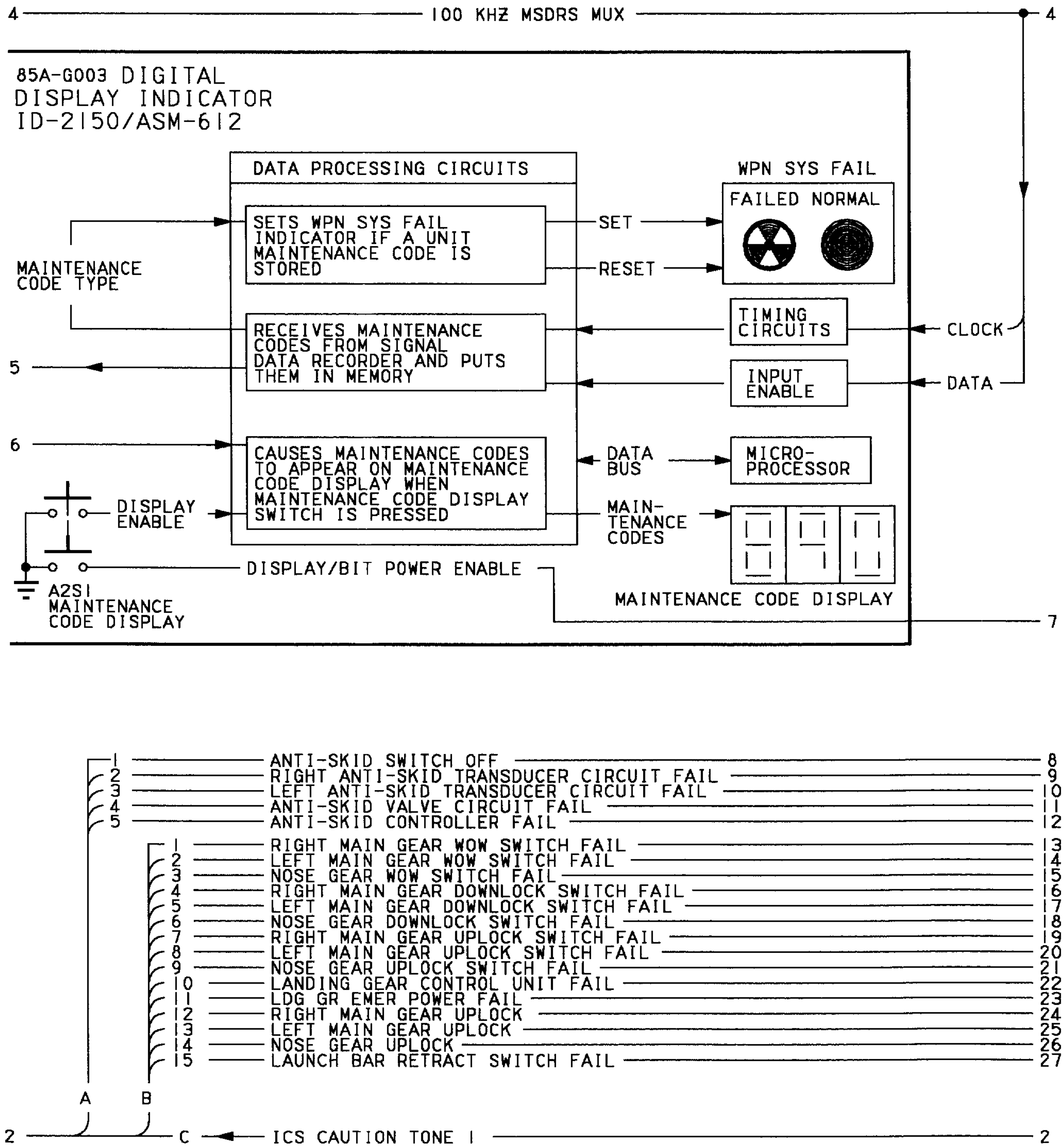


ELECTRICALLY ALTERABLE READ ONLY MEMORY-RECEIVES AND STORES MAINTENANCE CODES FOR DISPLAY

MAINT CODE	MAINTENANCE CODE MESSAGE
890	RIGHT MLG WOW SWITCH FAIL
891	LEFT MLG WOW SWITCH FAIL
892	NLG WOW SWITCH FAIL
893	RIGHT MLG DOWNLOCK SWITCH FAIL
894	LEFT MLG DOWNLOCK SWITCH FAIL
895	NLG DOWNLOCK SWITCH FAIL
896	RIGHT MLG UPLOCK SWITCH FAIL
897	LEFT MLG UPLOCK SWITCH FAIL
898	NLG UPLOCK SWITCH FAIL
899	LAUNCH BAR RETRACT PROXIMITY SWITCH FAIL
900	LANDING GEAR CONTROL UNIT EMERGENCY POWER FAIL
901	LEFT MLG PLANING LINK PROXIMITY SWITCH FAIL
902	RIGHT MLG PLANING LINK PROXIMITY SWITCH FAIL
7 903	HARD LANDING DATA
7 904	HARD LANDING INSPECTION
905	SKID CONTROL BOX ASSEMBLY FAIL
906	SKID CONTROL SYSTEM VALVE FAIL
907	LEFT MOTION PICKUP TRANSDUCER FAIL
908	RIGHT MOTION PICKUP TRANSDUCER FAIL
910	RIGHT MLG UPLOCK DID NOT OCCUR
911	LEFT MLG UPLOCK DID NOT OCCUR
912	NLG UPLOCK DID NOT OCCUR
915	LANDING GEAR CONTROL UNIT FAIL
916	ARRESTING GEAR DAMPER PRESSURE LOW

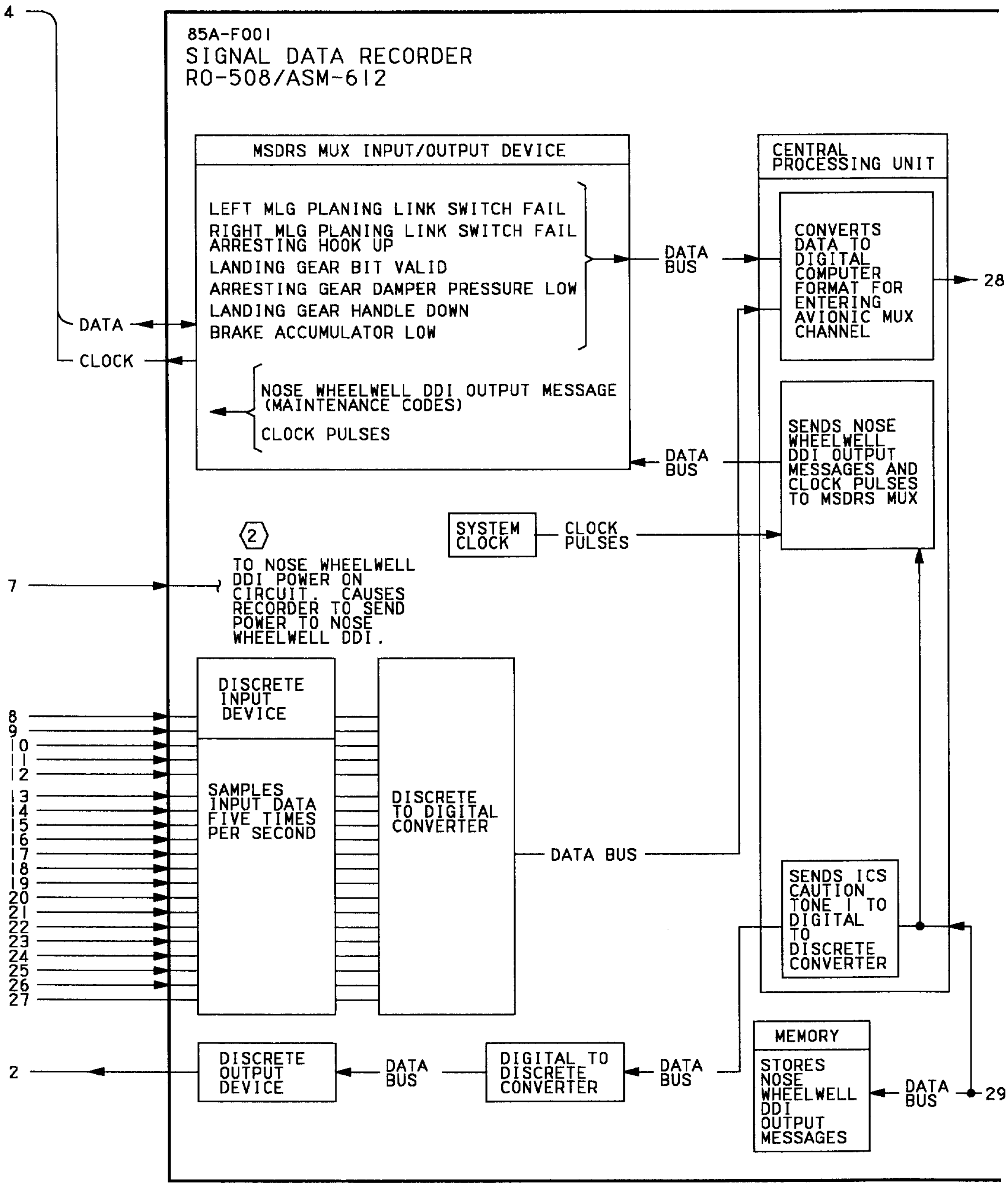
18AC-580-10-(14-4)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 4)



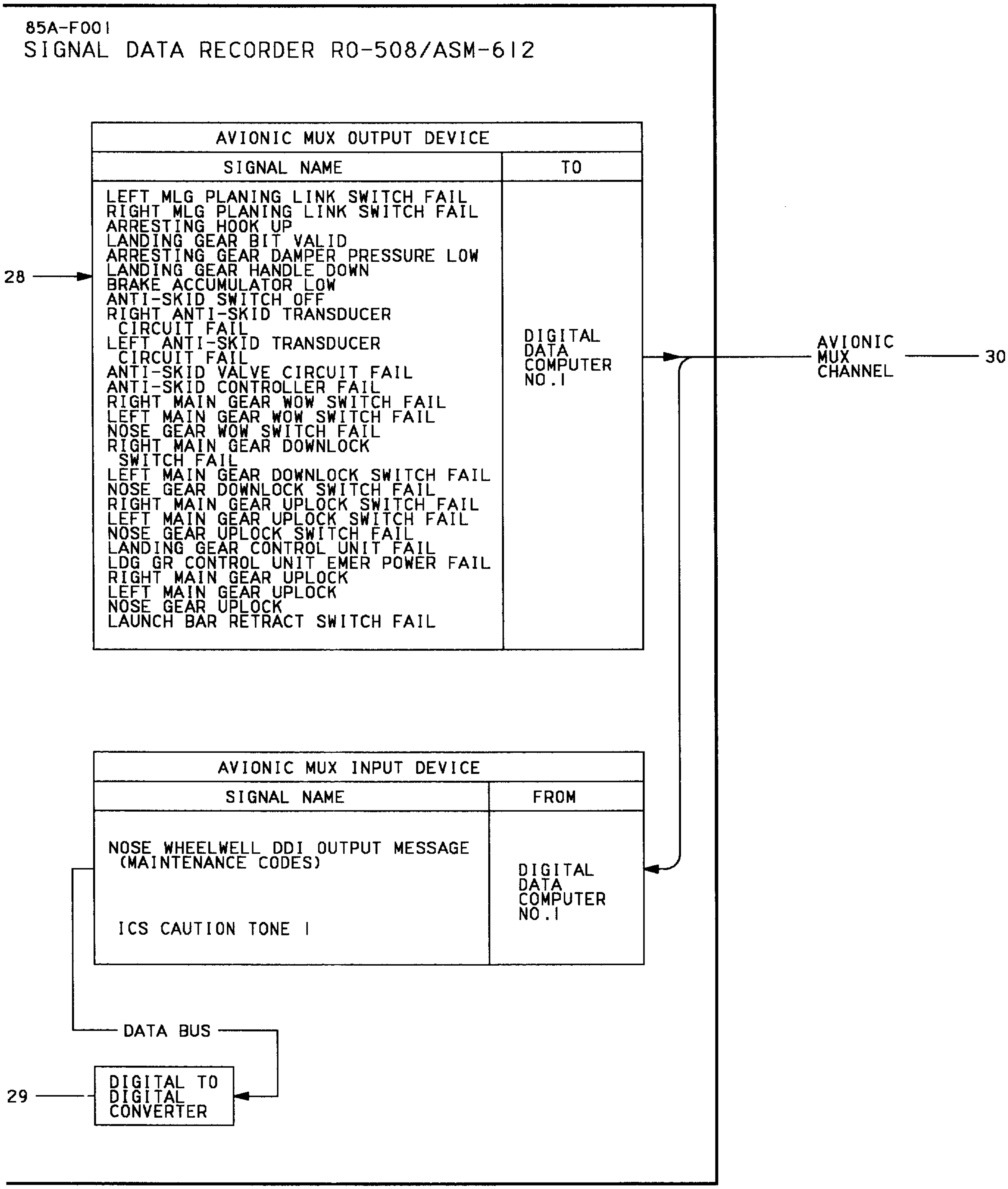
18AC-580-10-(14-5)C-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 5)



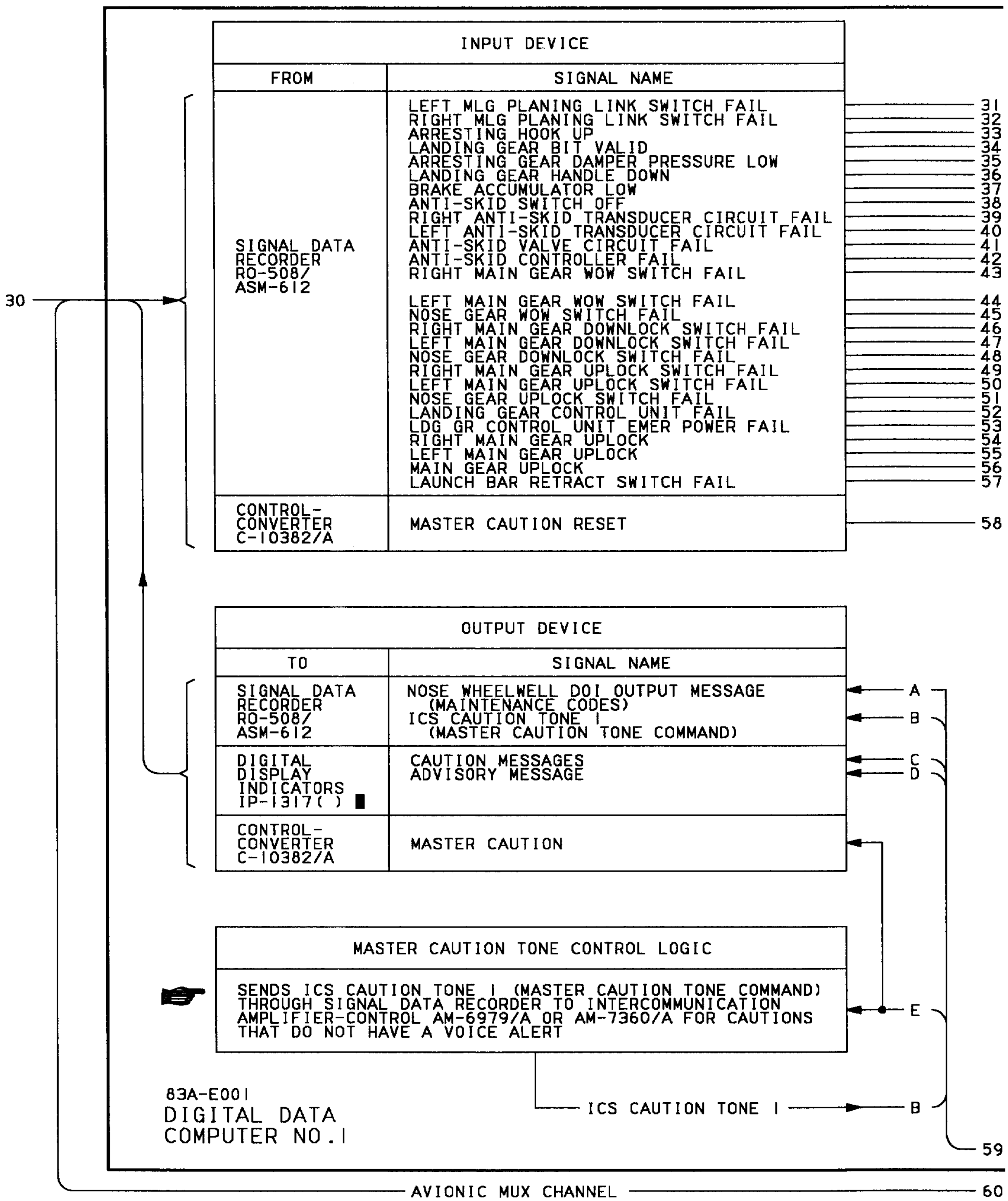
18AC-580-10-(14-6)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 6)



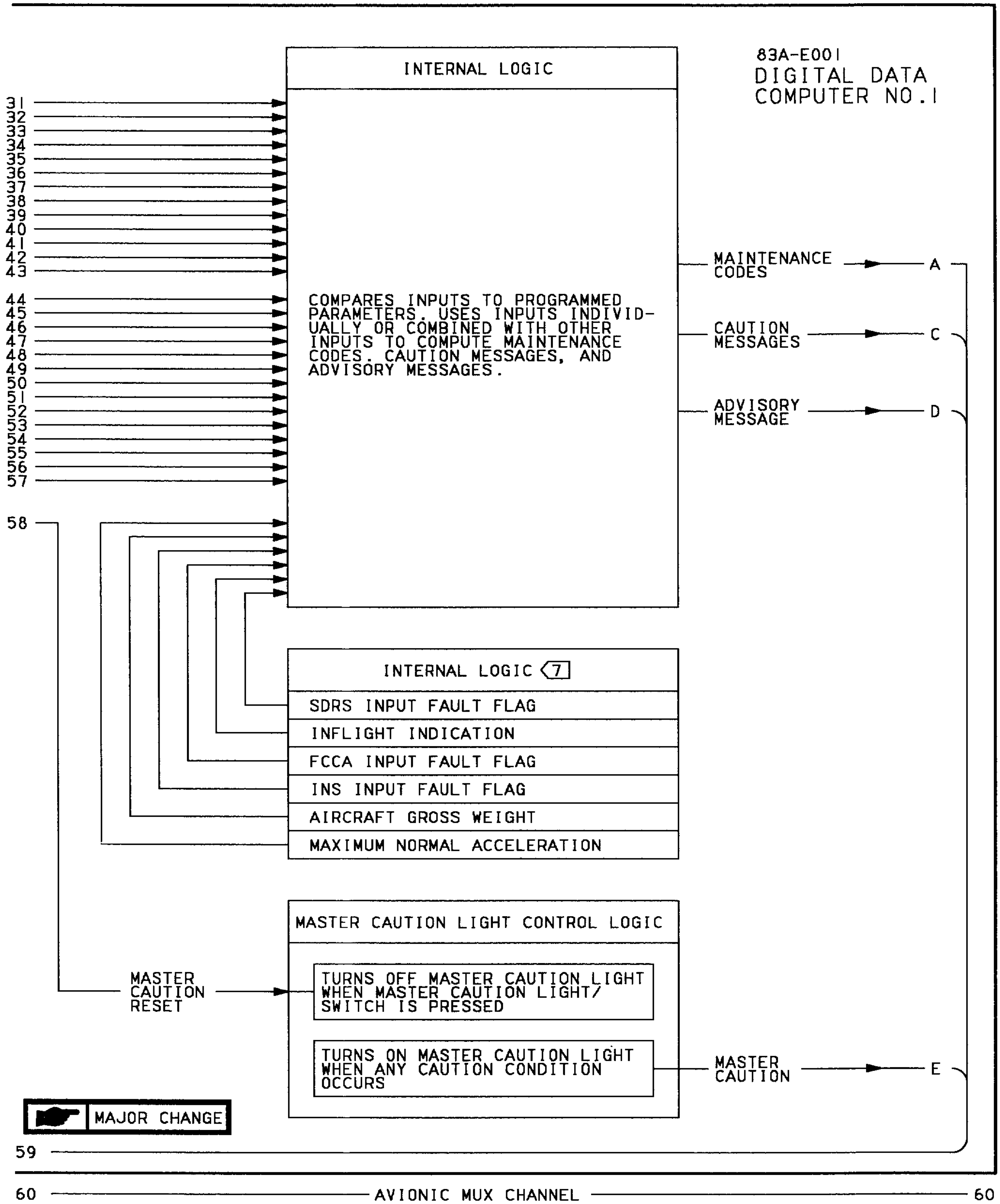
18AC-580-10-(14-7)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 7)



18AC-580-10-(14-8)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 8)



18AC-580-10-(14-9)13-GRID

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 9)

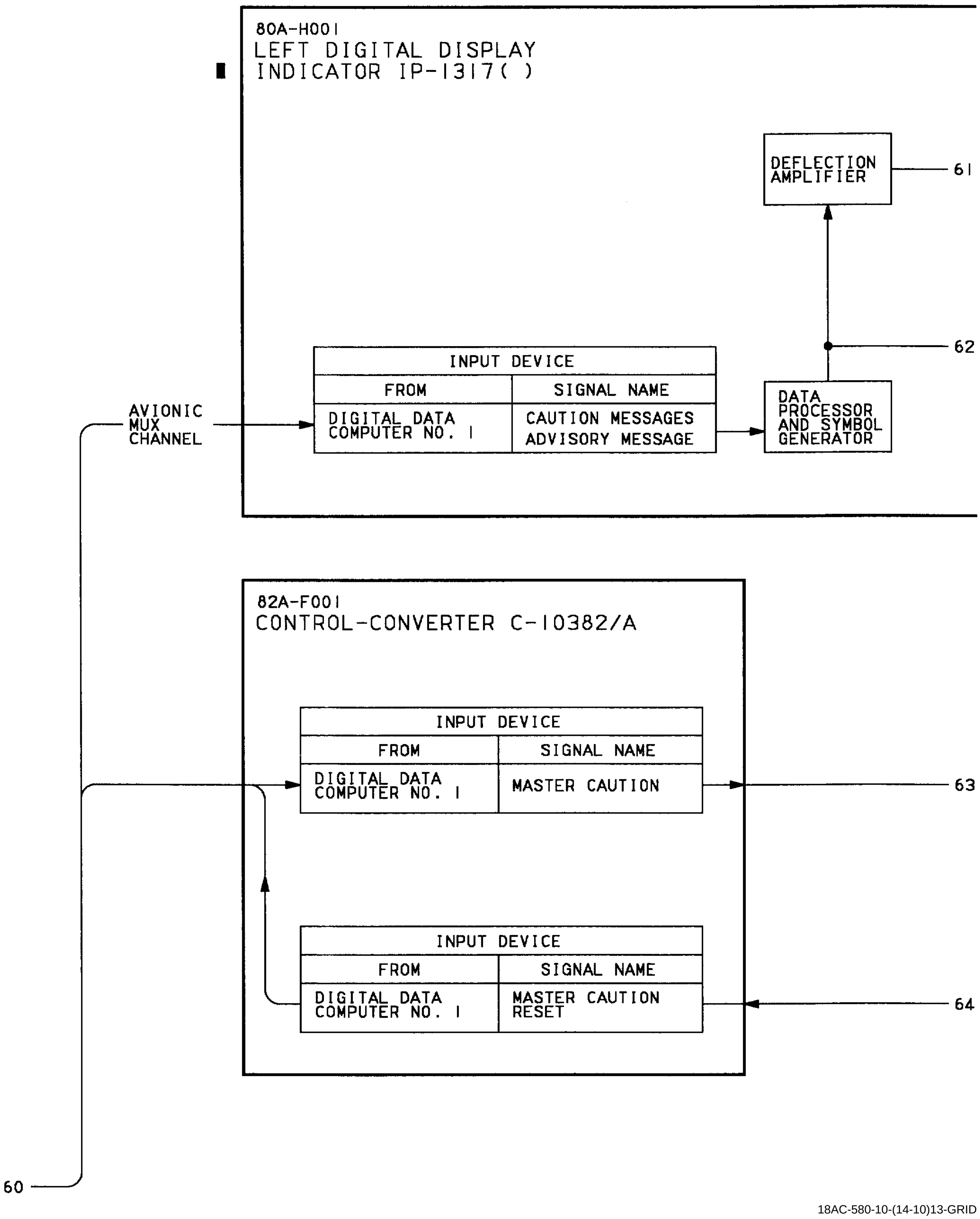


Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 10)

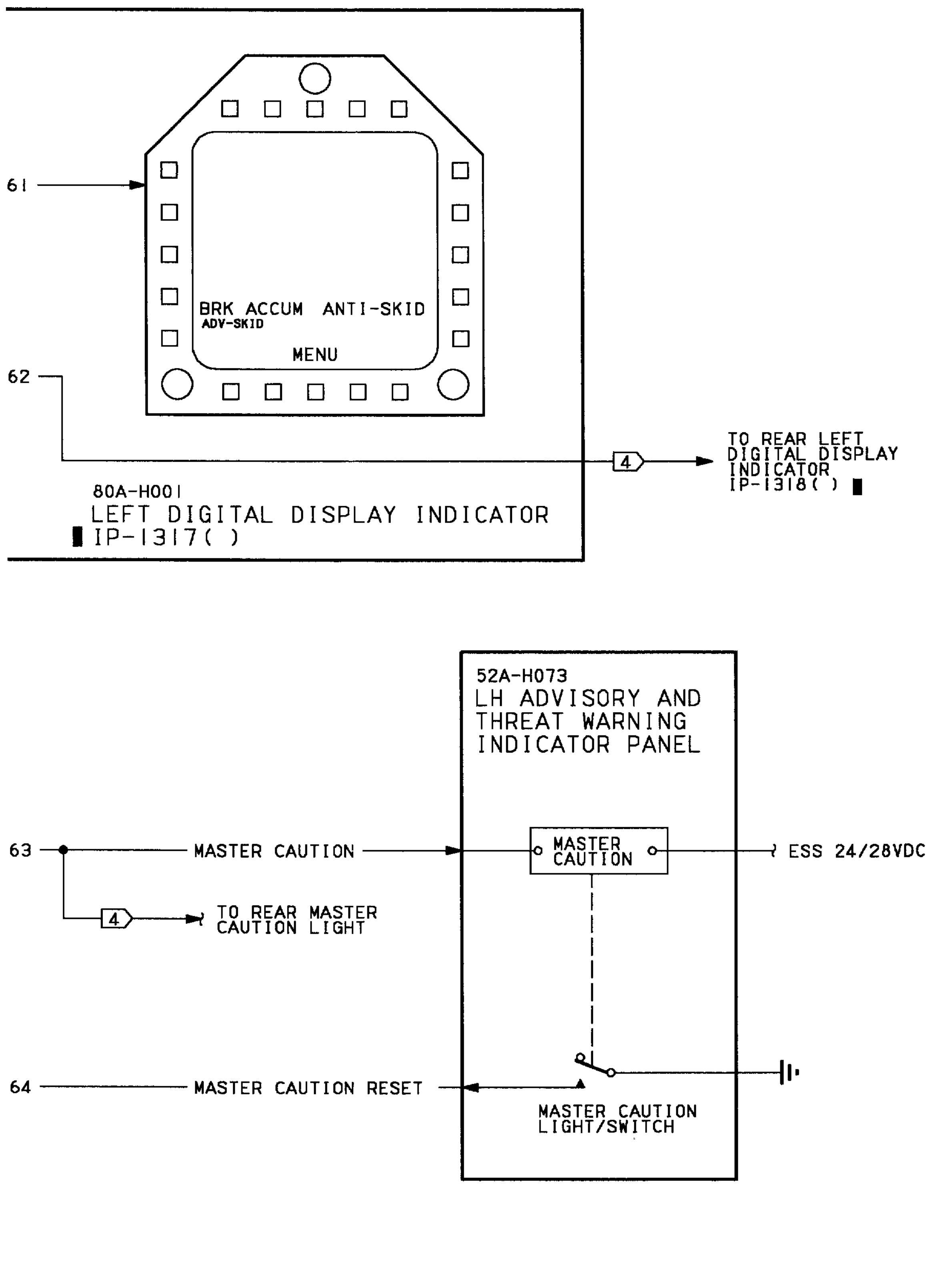
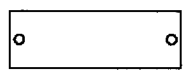


Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 11)

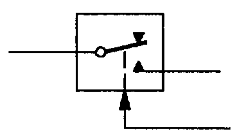
LEGEND

1. NONSTANDARD SYMBOLS:



TELELIGHT

SOLID STATE
ANALOG SWITCH



ENERGIZING SIGNAL

2 SIMPLIFIED POWER SCHEMATIC, WP006 00.

3 INPUT ALWAYS OPEN TO INDICATE LANDING GEAR CONTROL UNIT BIT VALID.

4 F/A-18B.

5 161353 THRU 161987, BEFORE F/A-18 AFC 48.

6 162394 AND UP, ALSO 161353 THRU 161987 AFTER F/A-18 AFC 48.

7 WITH DIGITAL COMPUTER NO.1 CONFIG/IDENT NUMBER 85A +.

8 162394 THRU 163175 AFTER F/A-18 AFC 292.

01900112

Figure 1. Landing Gear and Related Systems Interface Simplified Schematic (Sheet 12)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - ELECTRICAL AND HYDRAULIC SYSTEMS INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

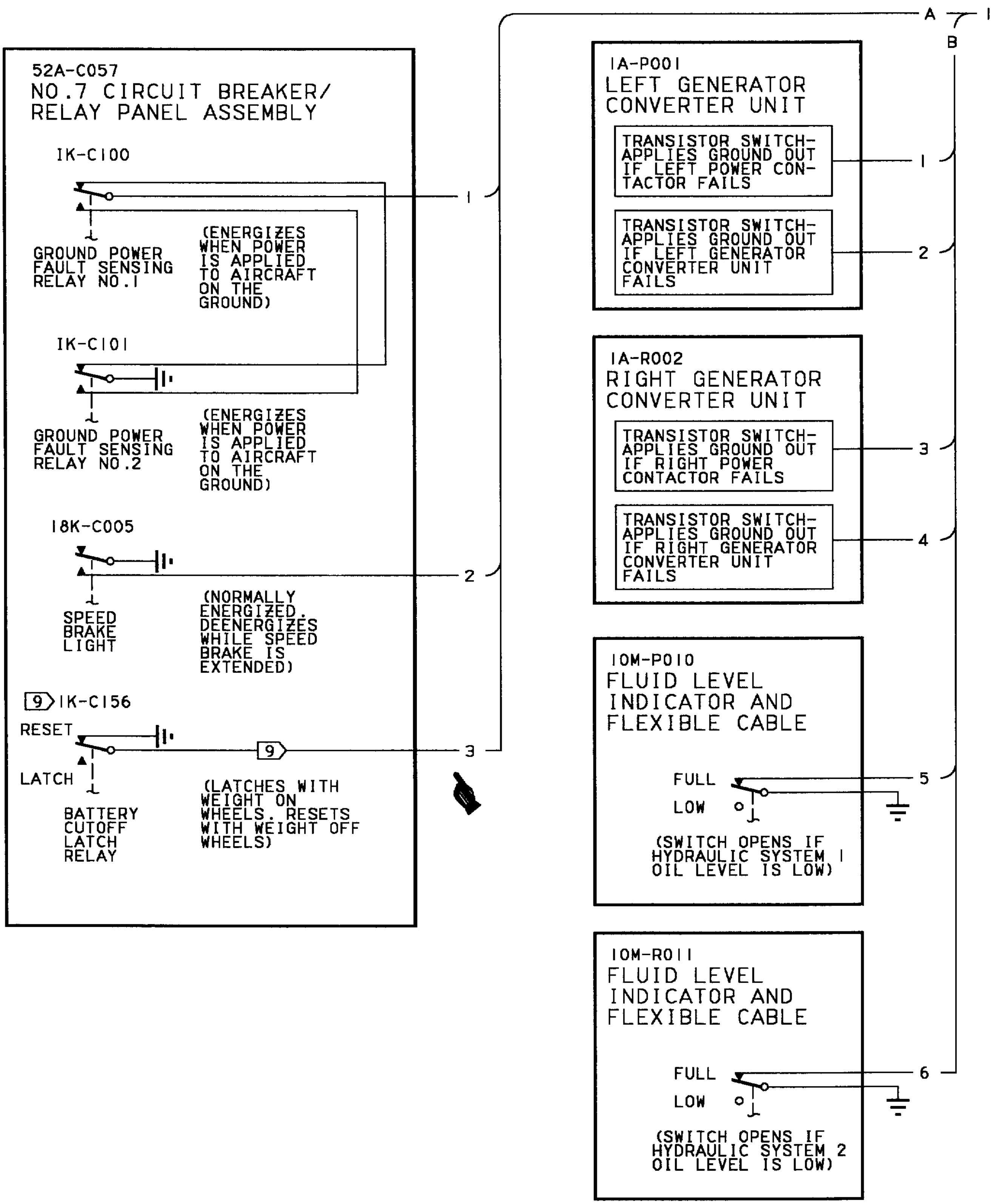
Reference Material

None

Alphabetical Index

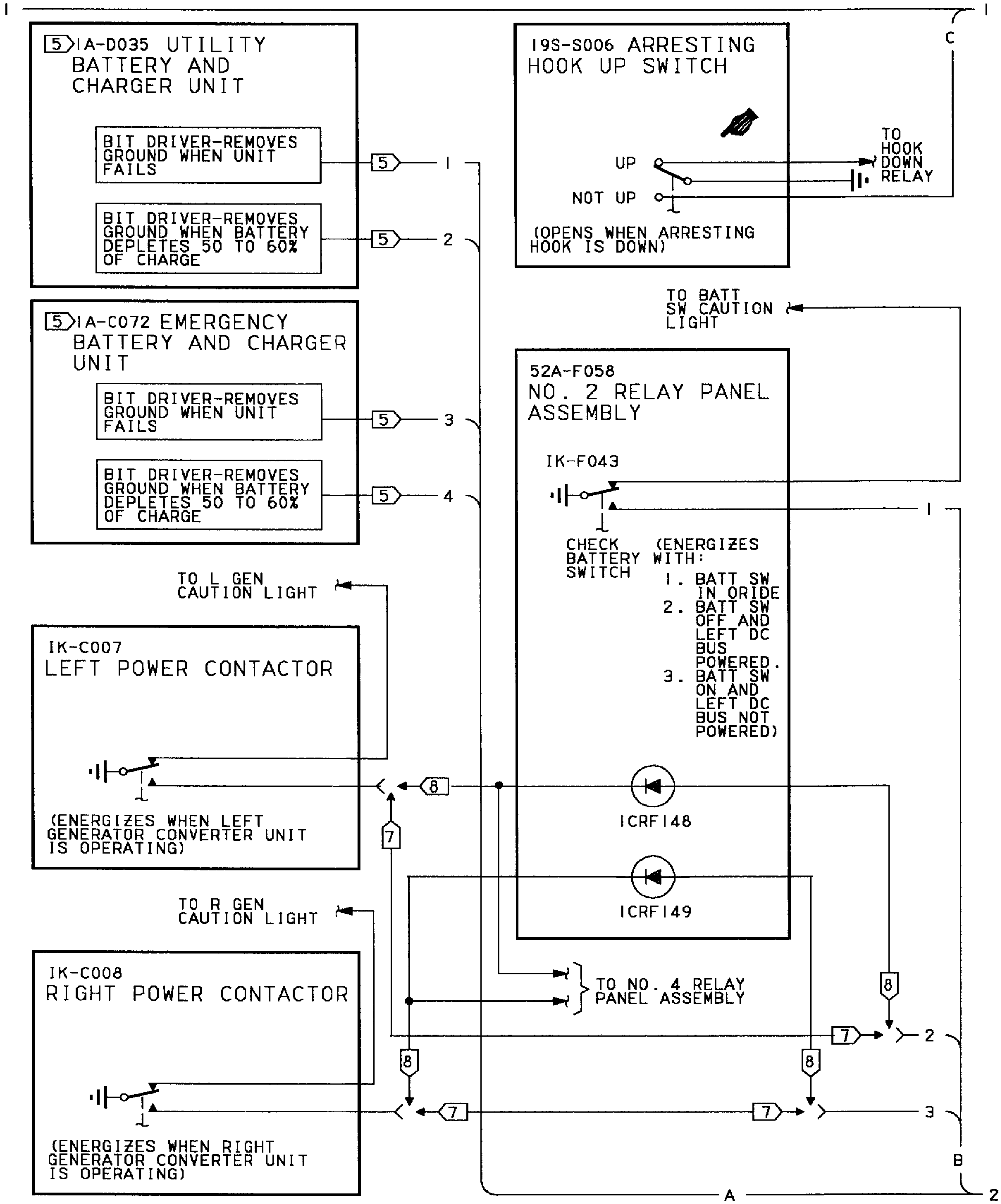
Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F18 AFC 49	-	Addition of Sealed Lead Acid Battery (ECP MDA-F/A-18-00074)	1 Sep 86	ECP coverage only
F/A-18 AFC 90	-	Incorporation of GFE Battery Relay Control Unit (ECP MDA-F/A-18-00165R1)	1 Aug 88	ECP coverage only



18AC-580-10-(15-1)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 1)



18AC-580-10-(15-2)C-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 2)

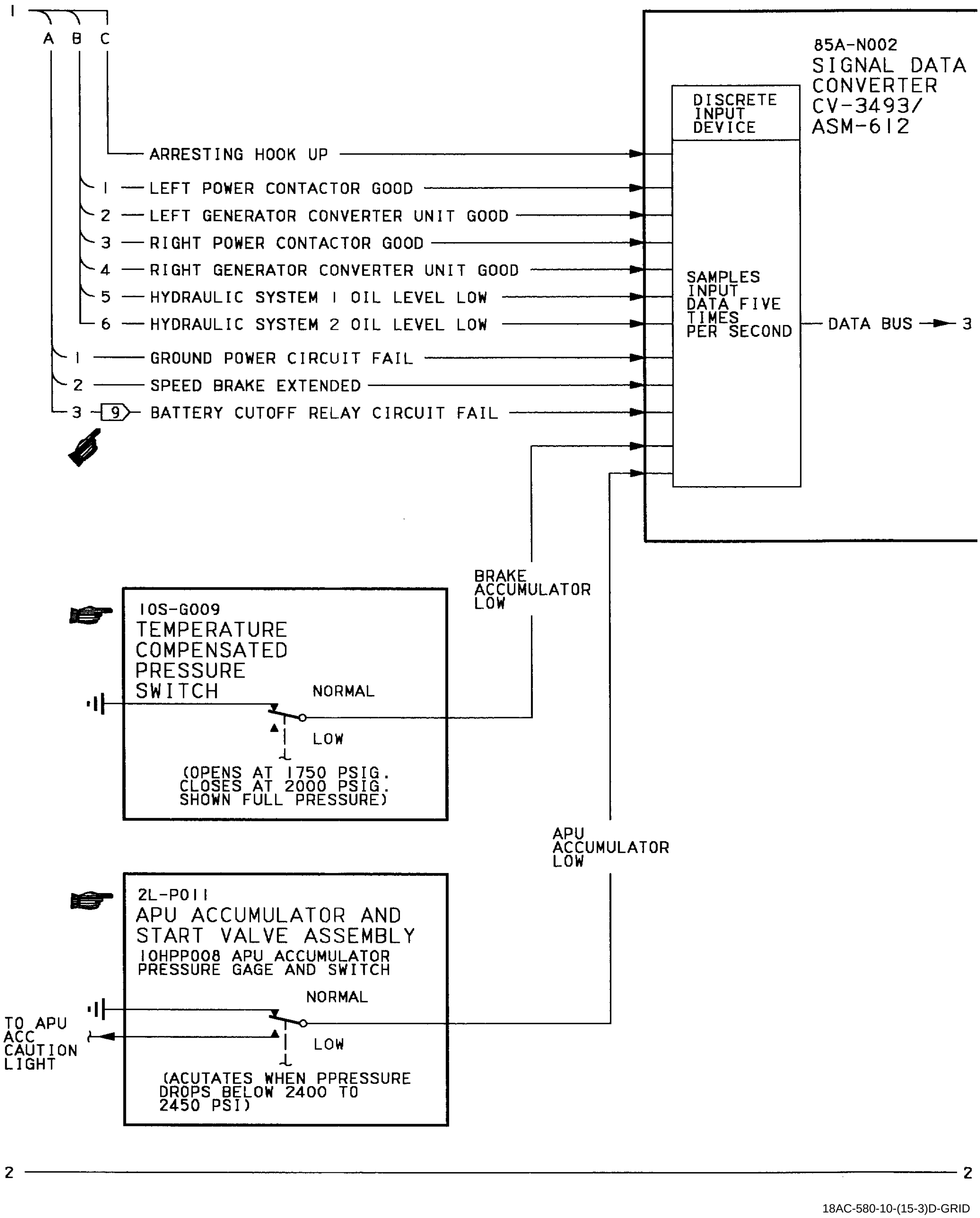
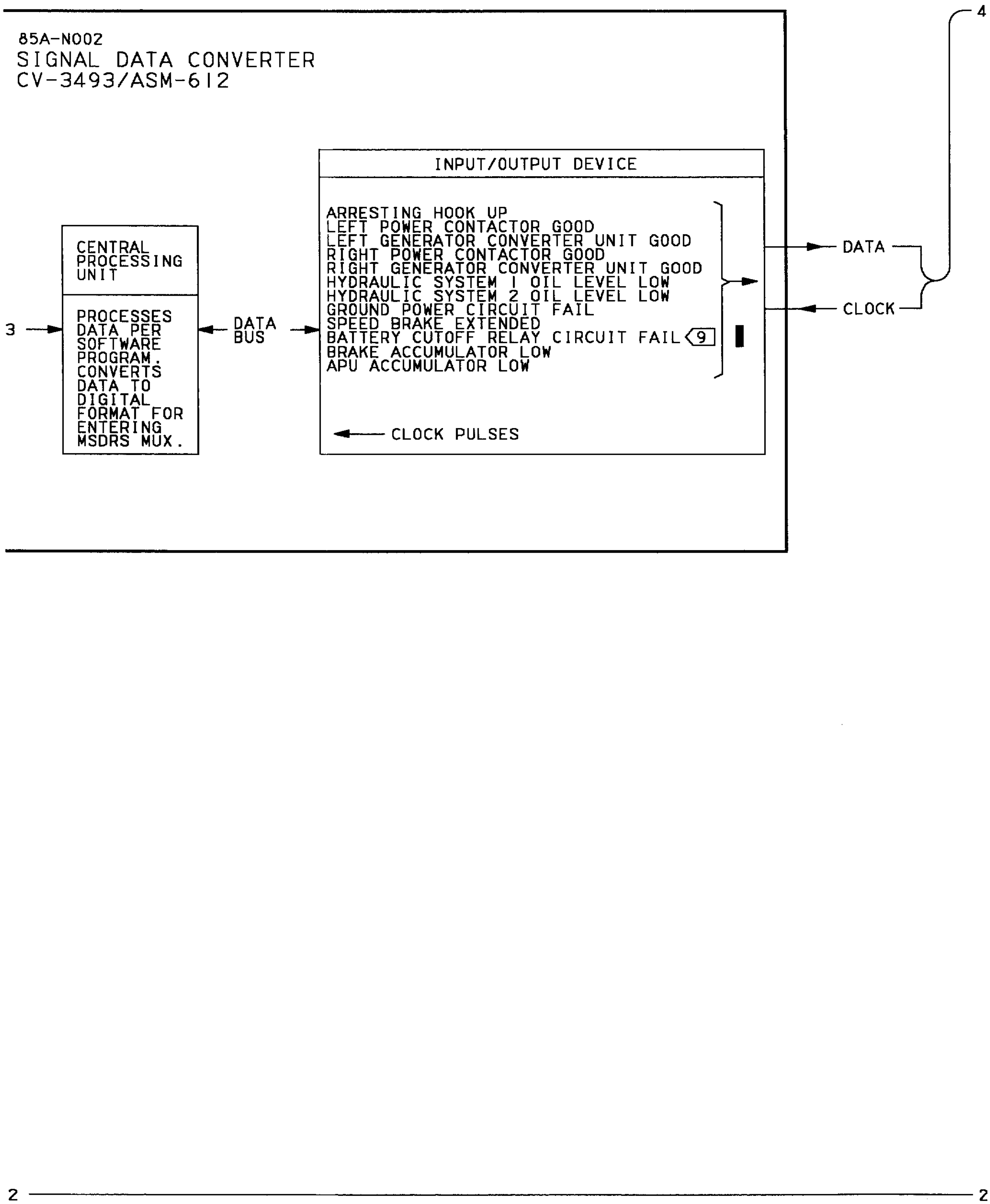
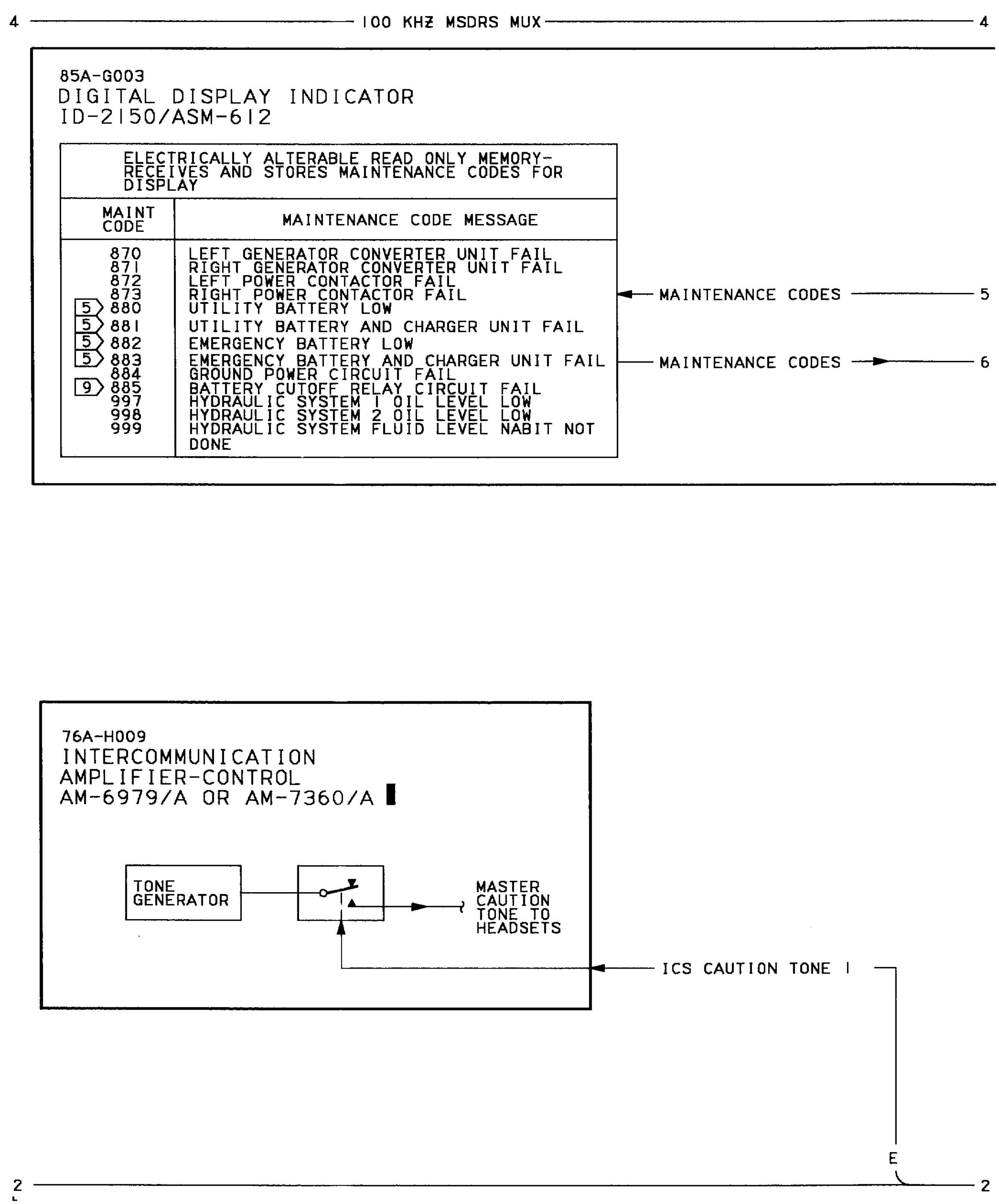


Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 3)



18AC-580-10-(15-4)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 4)



18AC-580-10-(15-5)13-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 5)

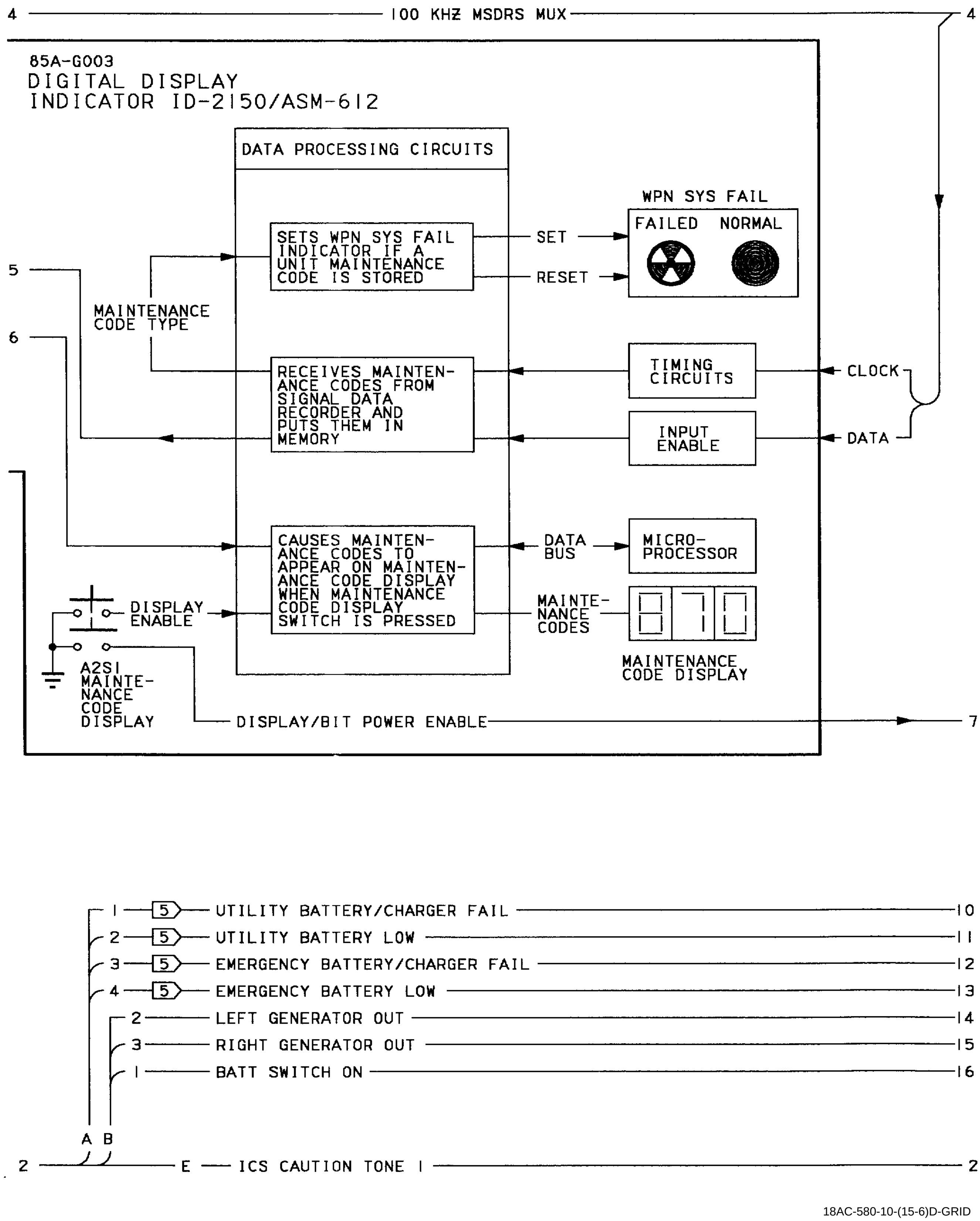
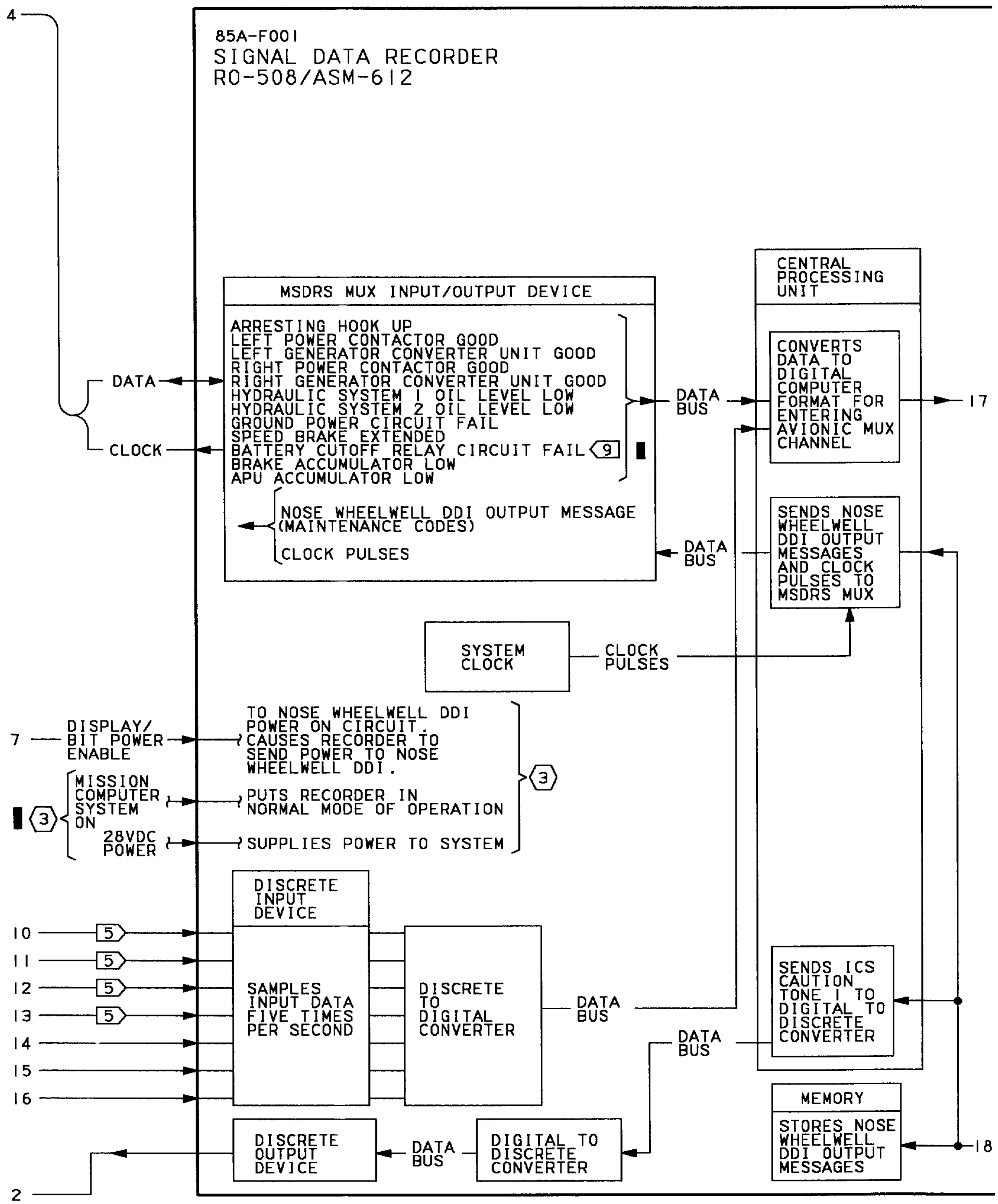
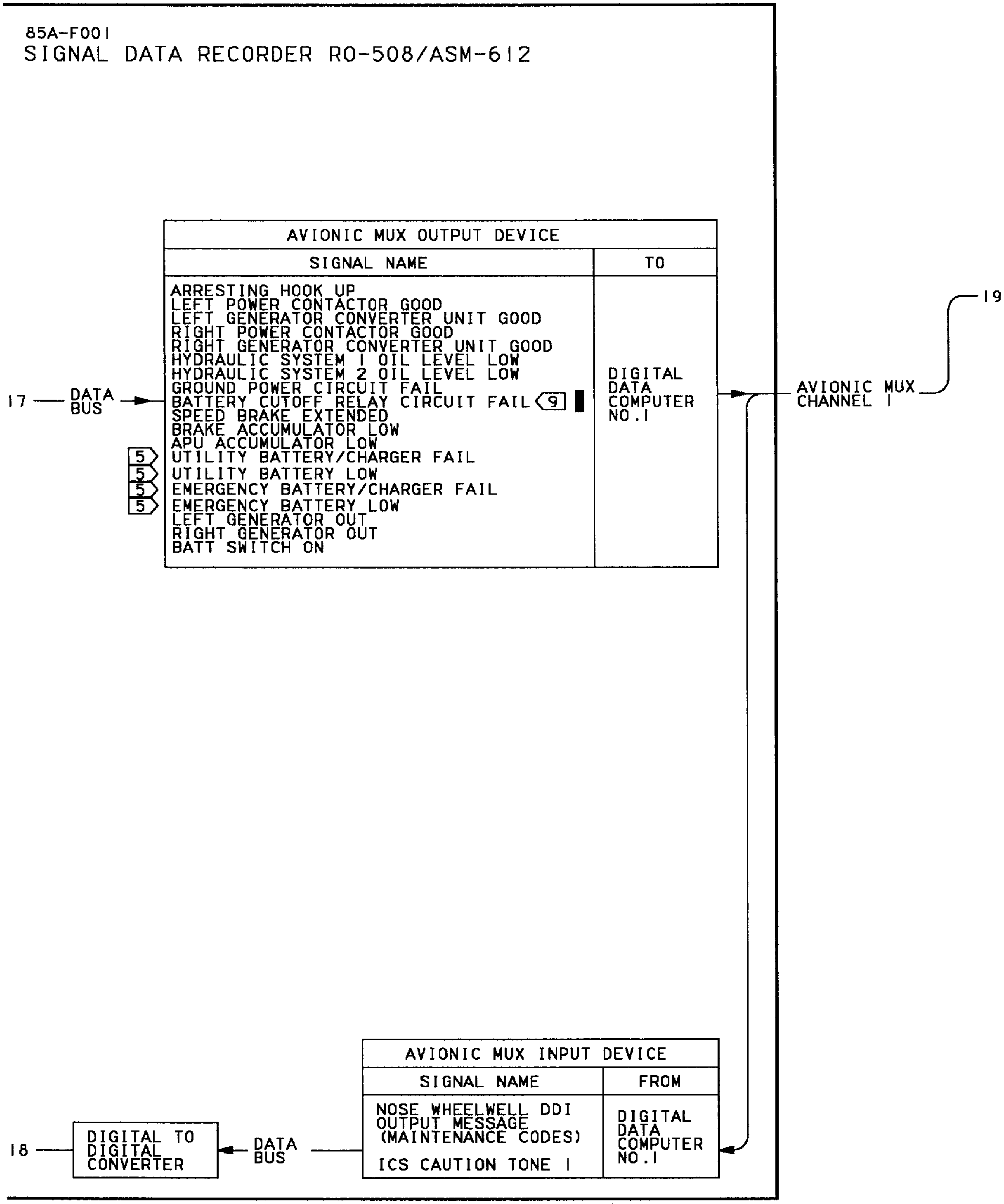


Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 6)



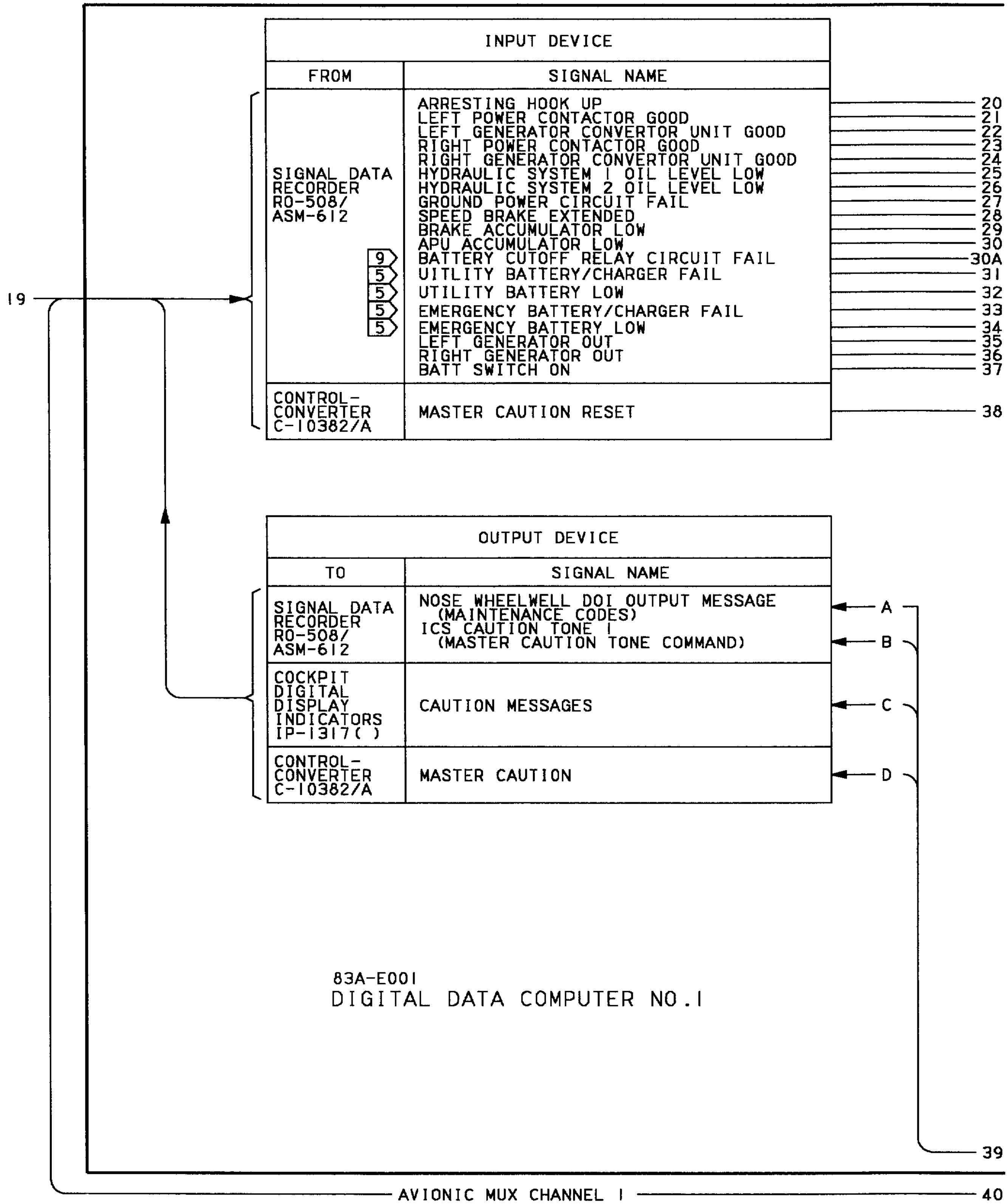
18AC-580-10-(15-7)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 7)



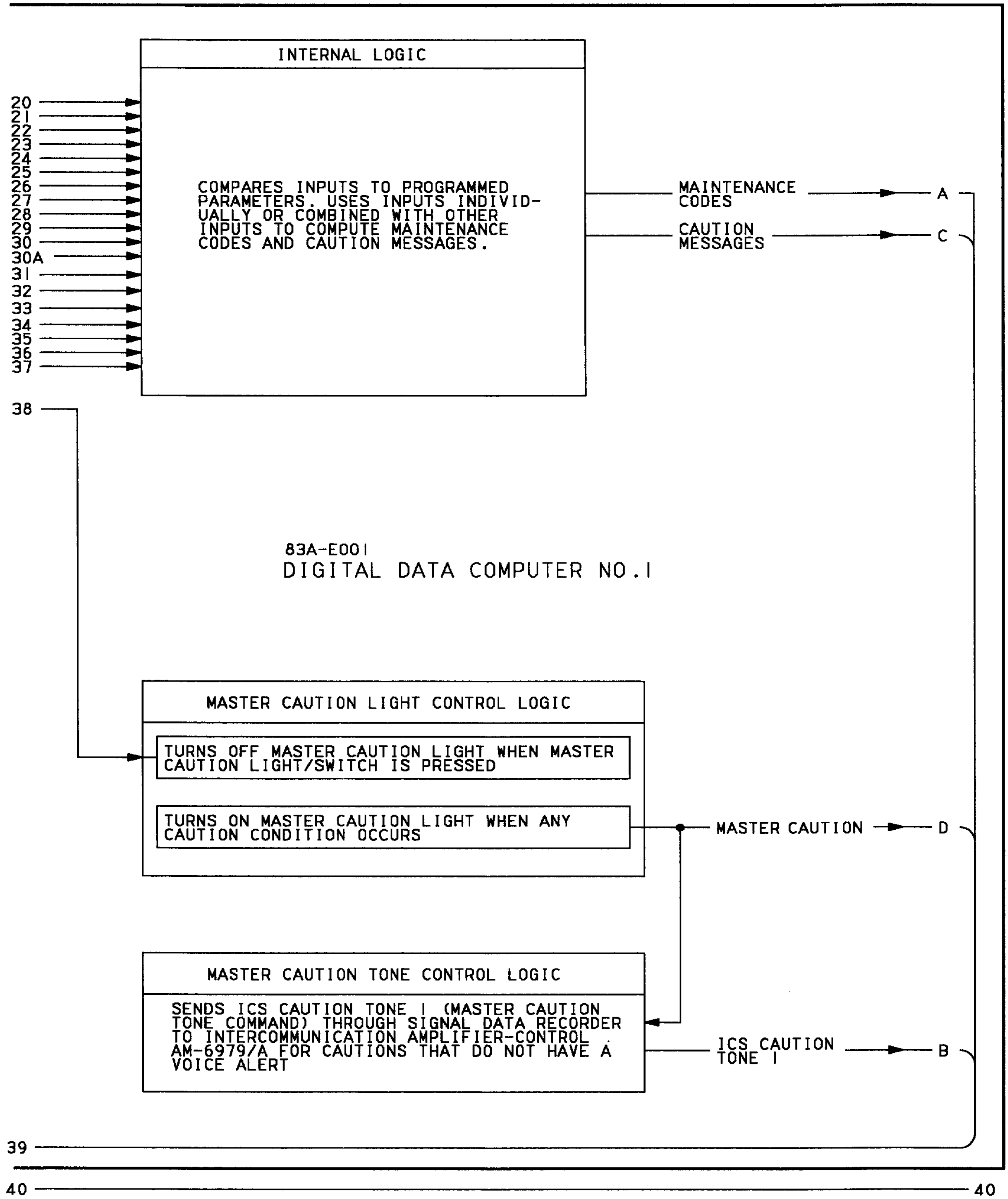
18AC-580-10-(15-8)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 8)



18AC-580-10-(15-9)13-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 9)



18AC-580-10-(15-10)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 10)

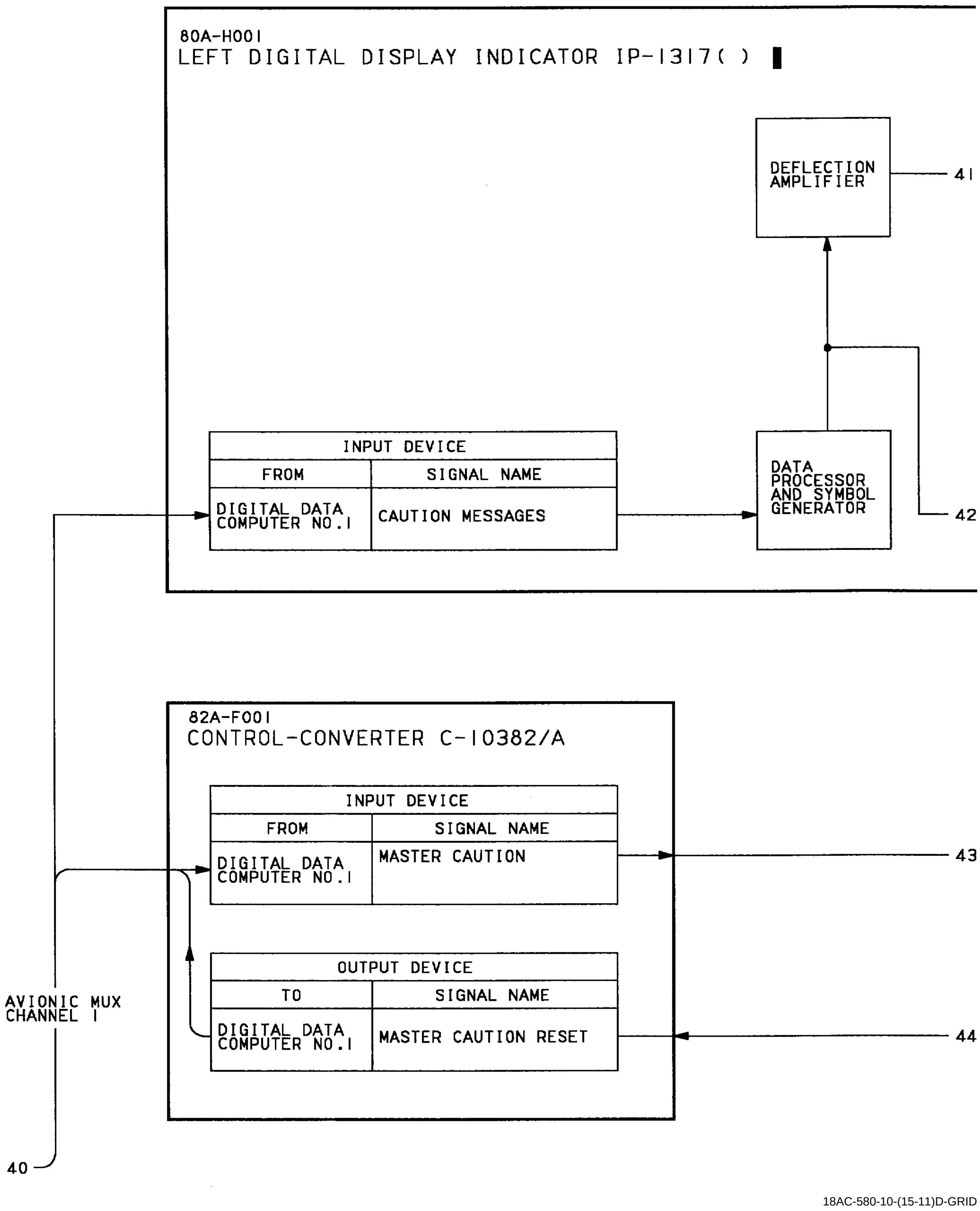
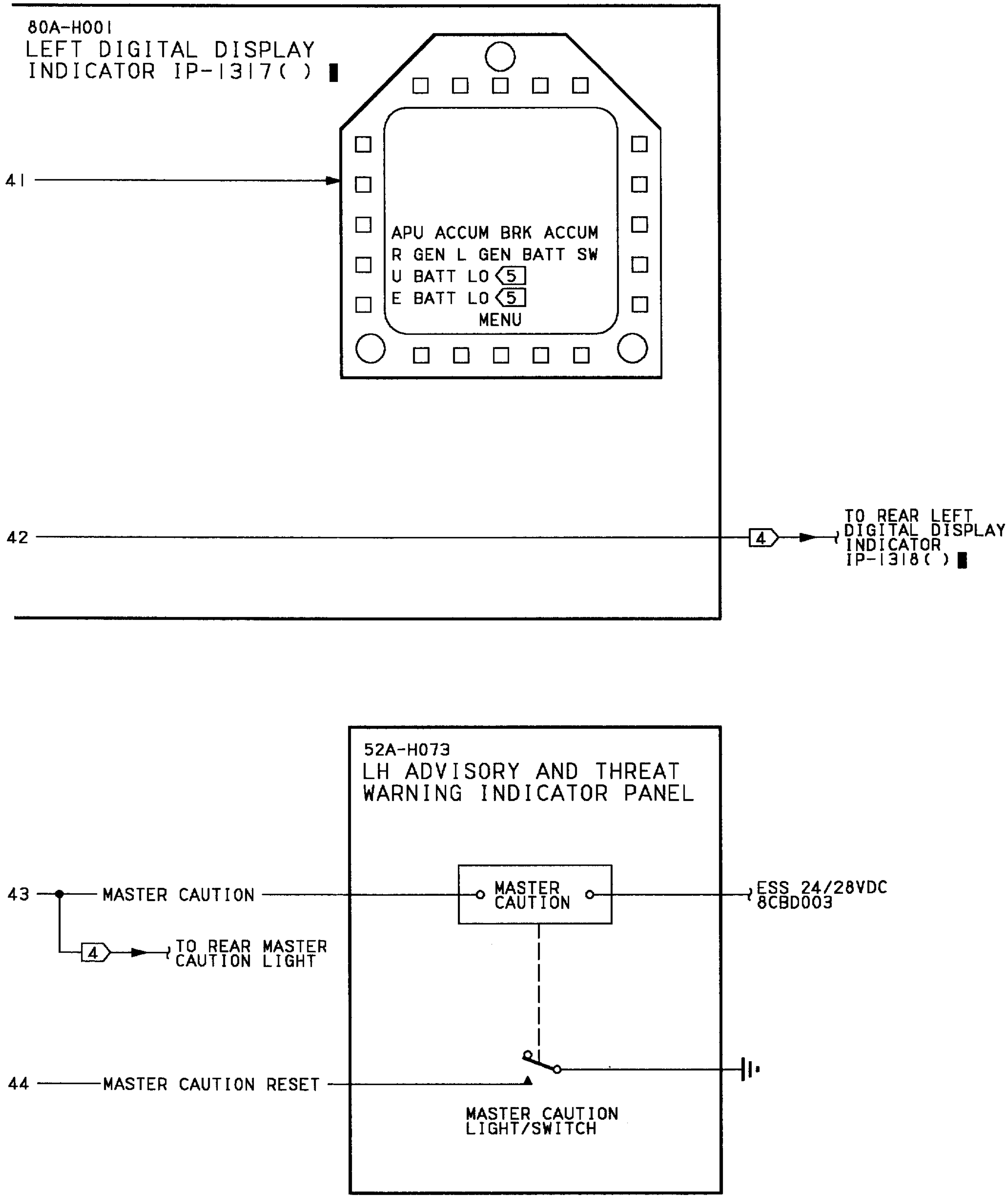


Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 11)

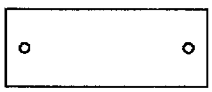


18AC-580-10-(15-12)D-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 12)

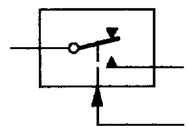
LEGEND

1. NONSTANDARD SYMBOLS:



TELELIGHT

SOLID STATE
ANALOG SWITCH



ENERGIZING SIGNAL

⟨2⟩ DELETED.

⟨3⟩ SIMPLIFIED POWER SCHEMATIC, WP006 00.

[4] F/A-18B.

[5] 161353 THRU 161528 BEFORE F/A-18 AFC 49.

[6] 161702 AND UP.

[7] 161353 THRU 161987.

[8] 162394 AND UP.

[9] 163119 AND UP; ALSO 161353 THRU 163118 AFTER F/A-18 AFC 90.

18AC-580-10-(15-13)13-GRID

Figure 1. Electrical and Hydraulic Systems Interface Simplified Schematic (Sheet 13)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - SECONDARY POWER SYSTEM INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

None

Alphabetical Index

Subject **Page No.**

Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 26	-	Air Turbine Starter/Airframe Mounted Accessory Drive (AMAD) Design Changes (ECP MDA F/A-18-000-618)	15 Jun 86	ECP Coverage Only
F/A-18 AFC 27	-	Improvement of Leading Edge Flap Design (ECP MDA-F/A-18-00044)	15 Jun 86	ECP Coverage Only

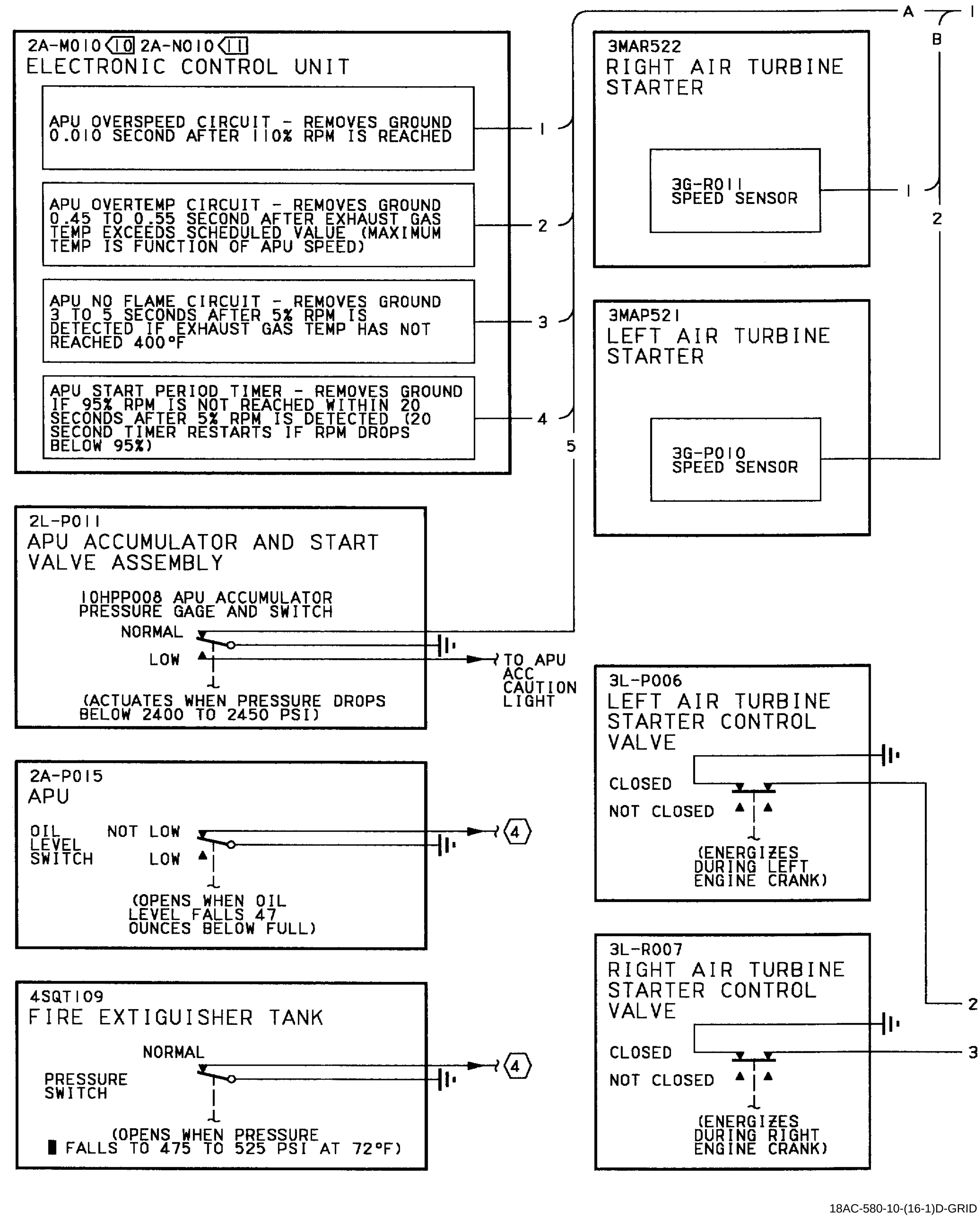
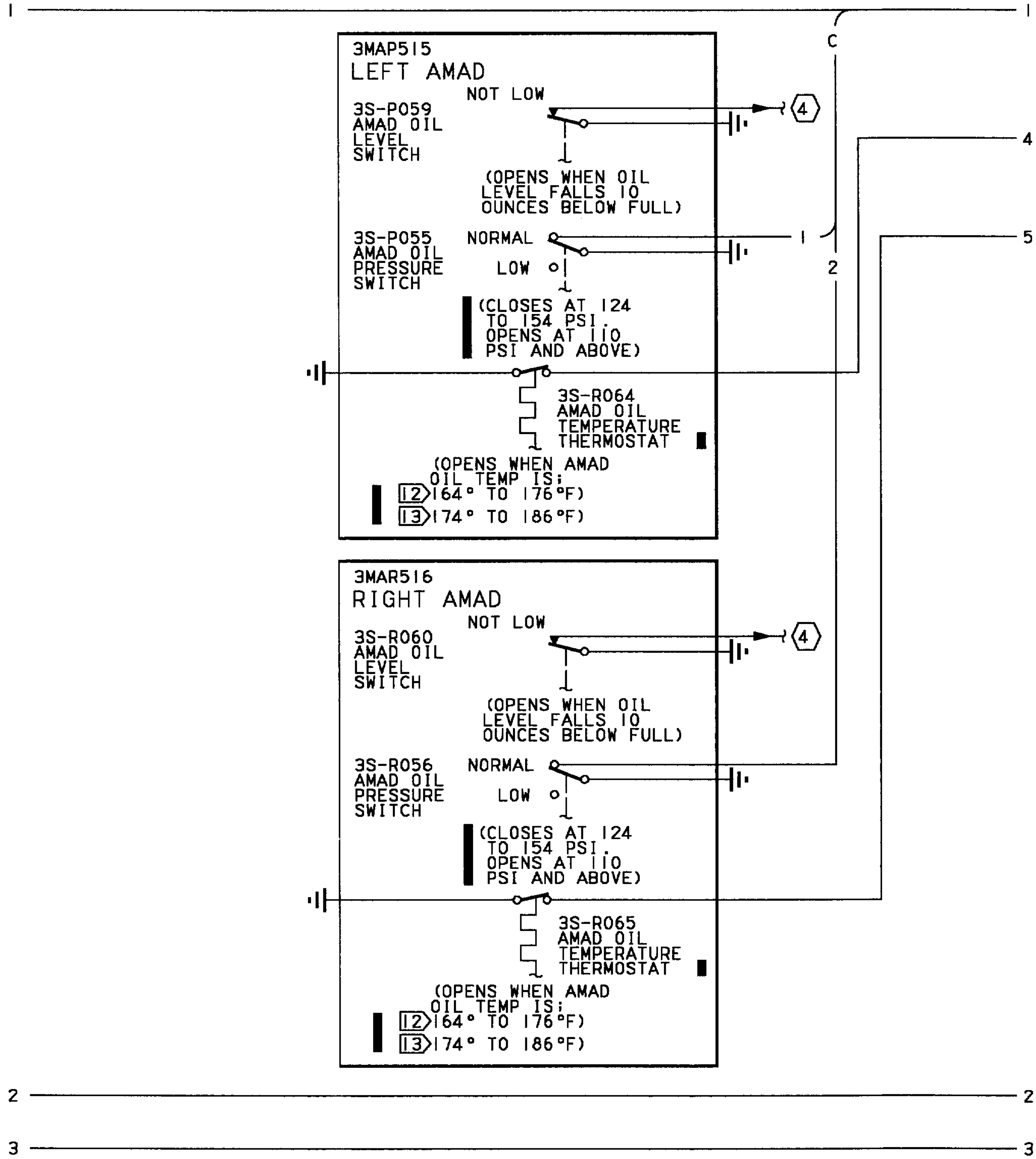
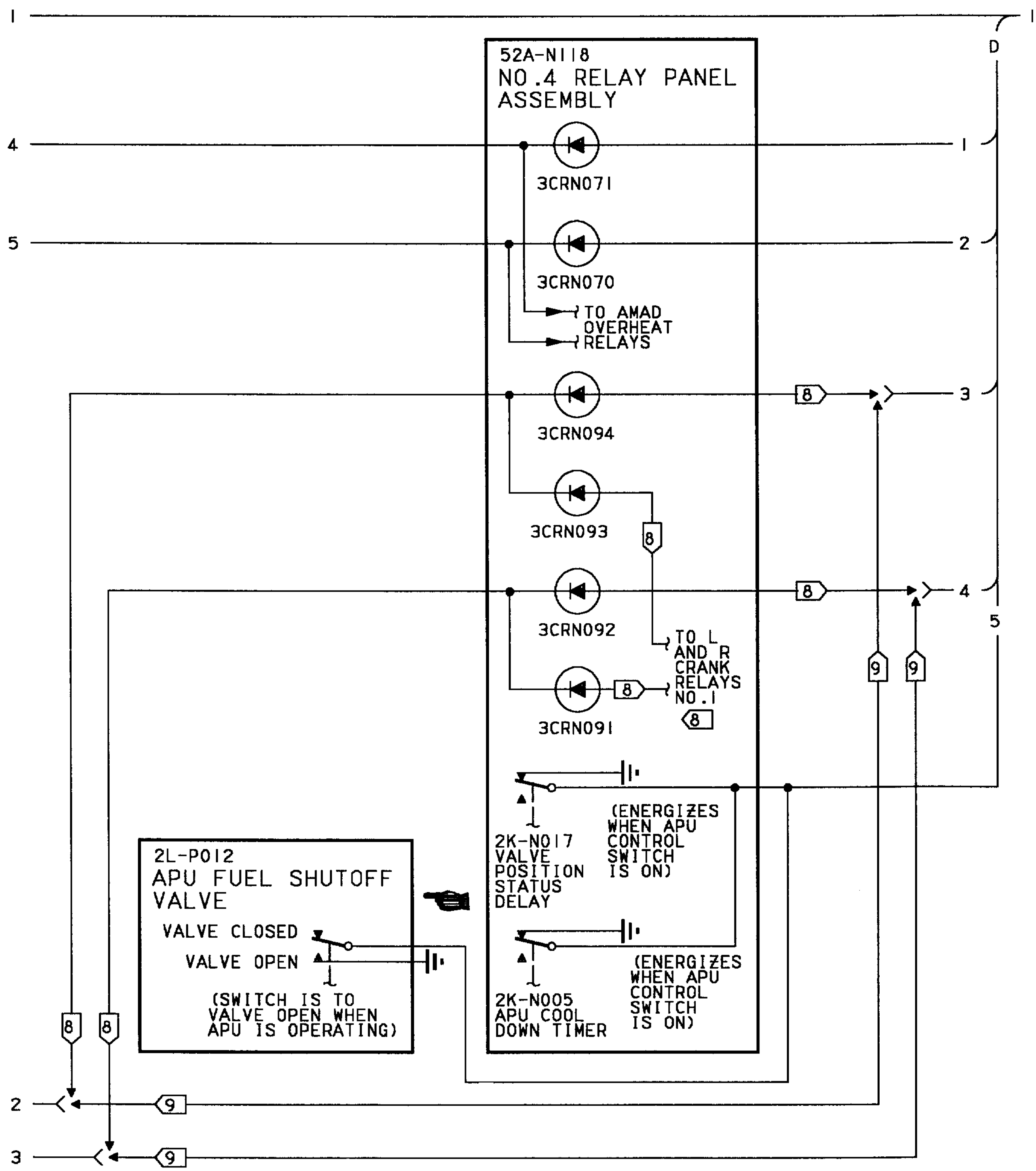


Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 1)



18AC-580-10-(16-2)D-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 2)



18AC-580-10-(16-3)C-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 3)

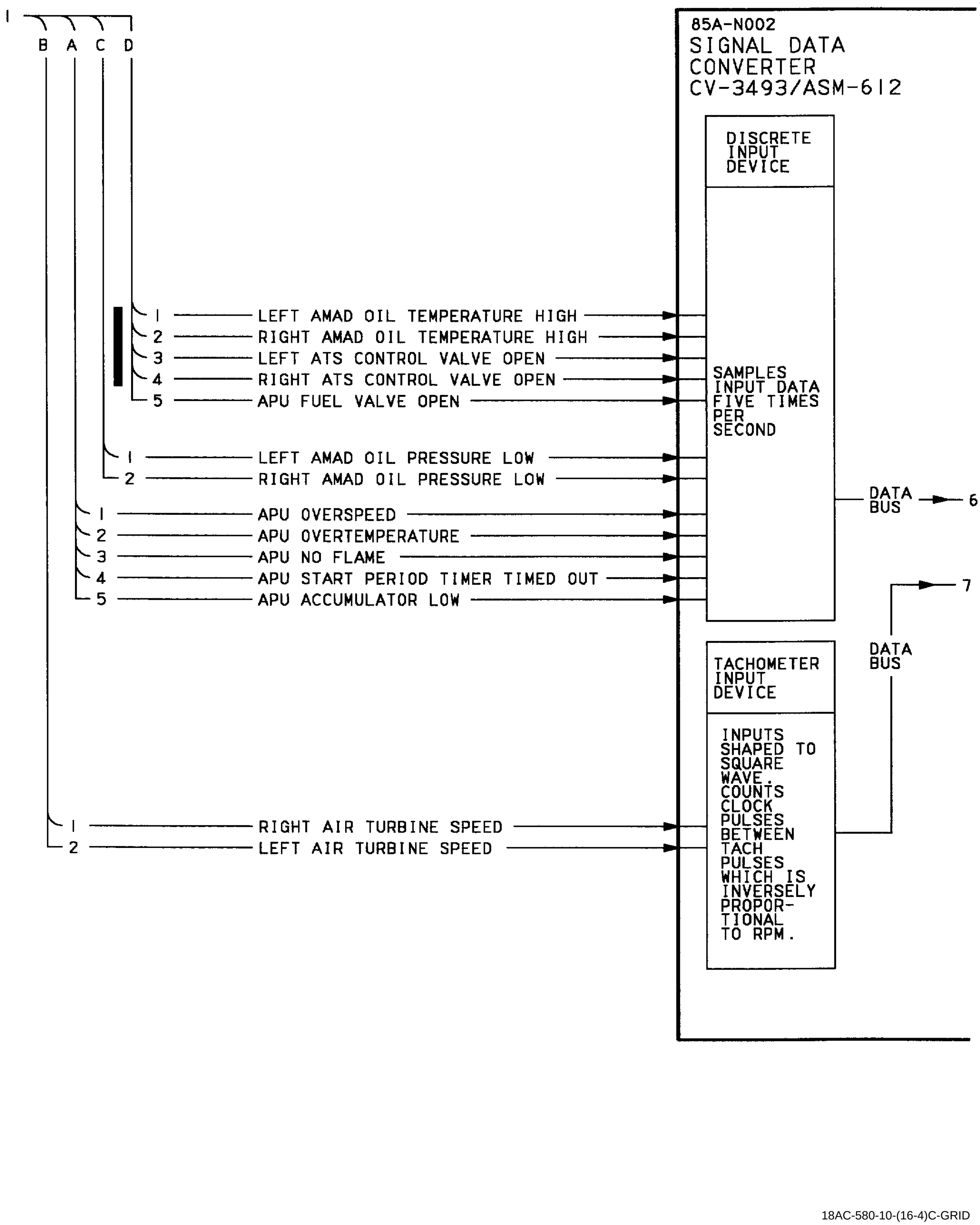
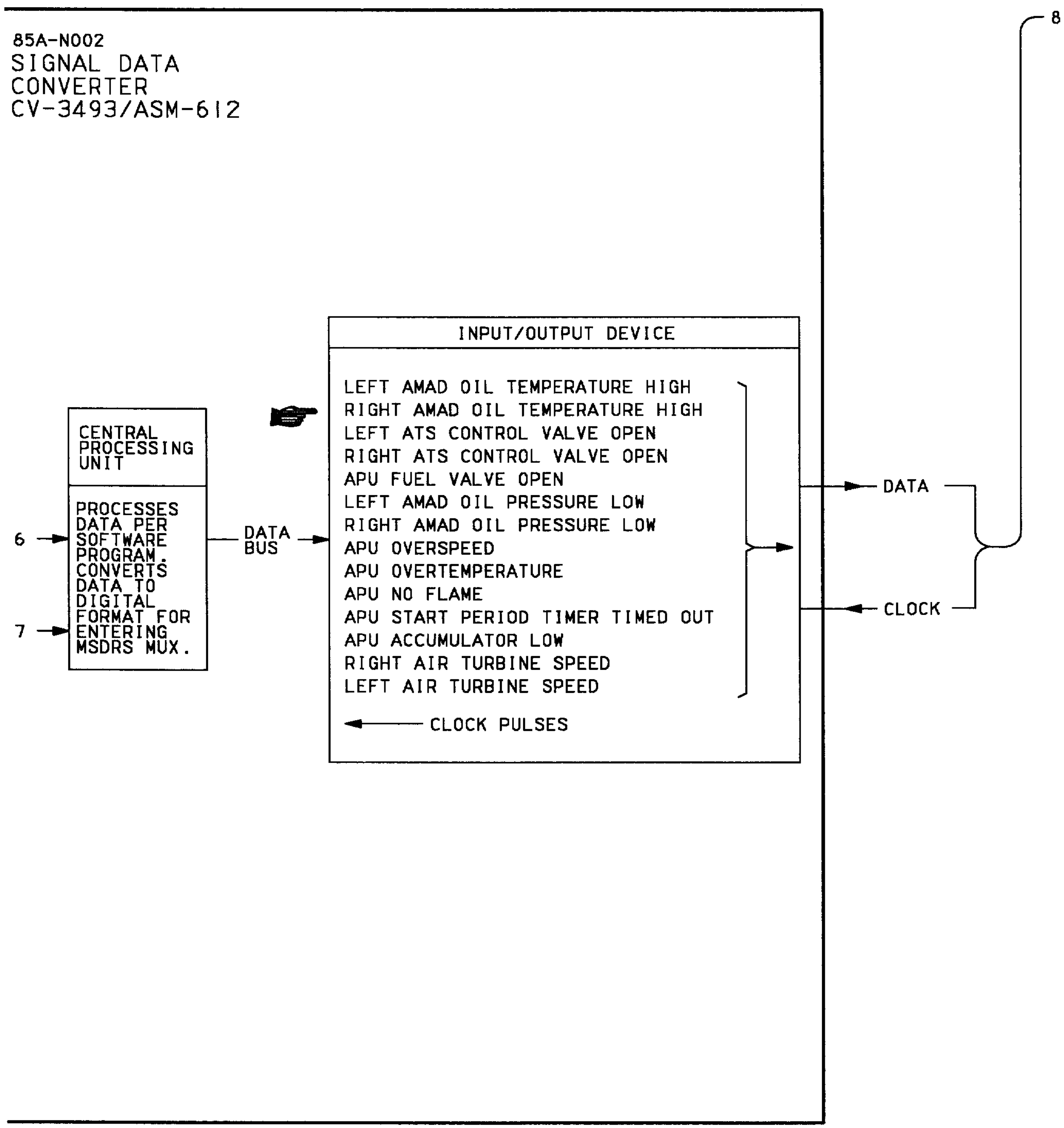
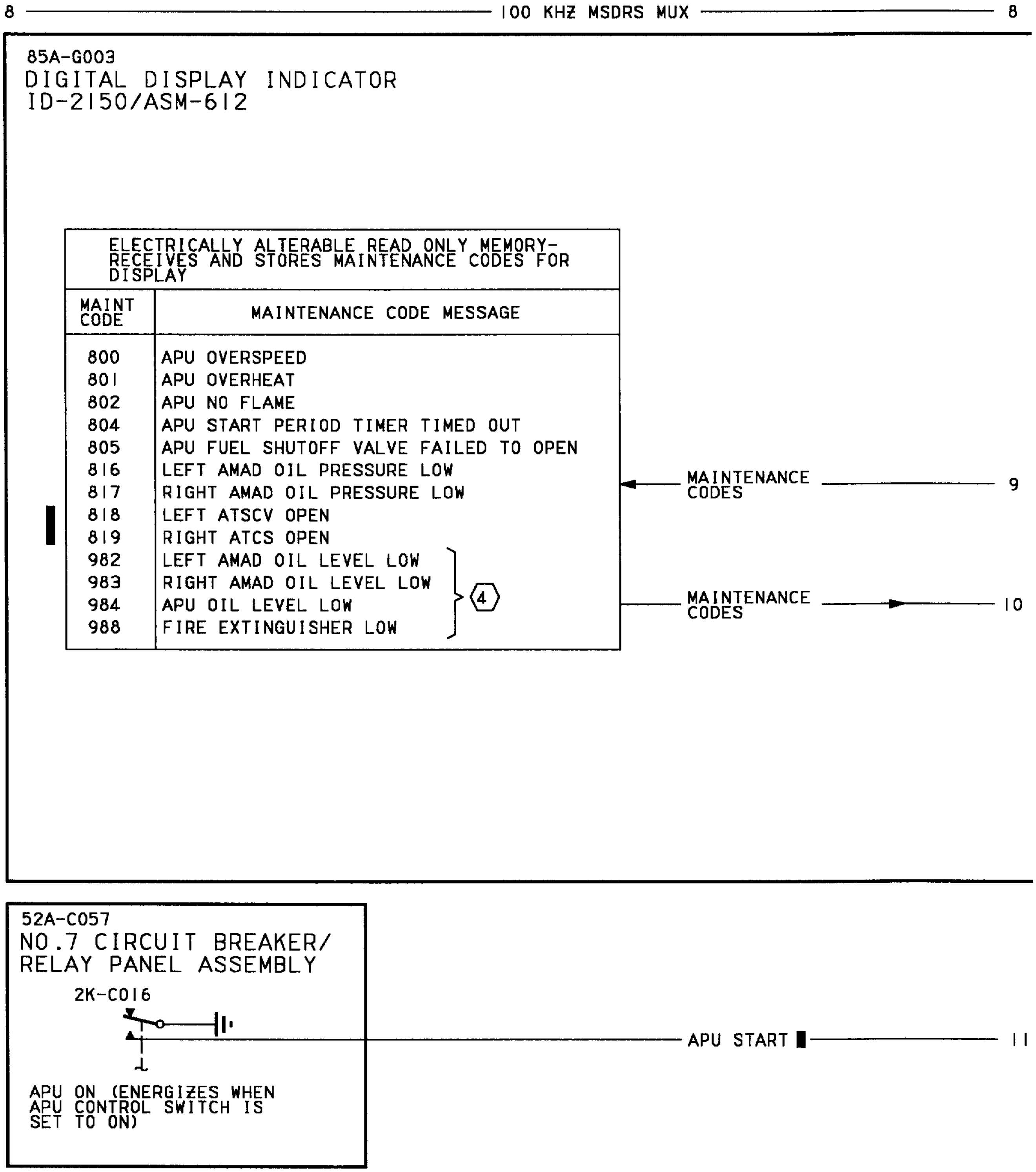


Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 4)



18AC-580-10-(16-5)C-GRID

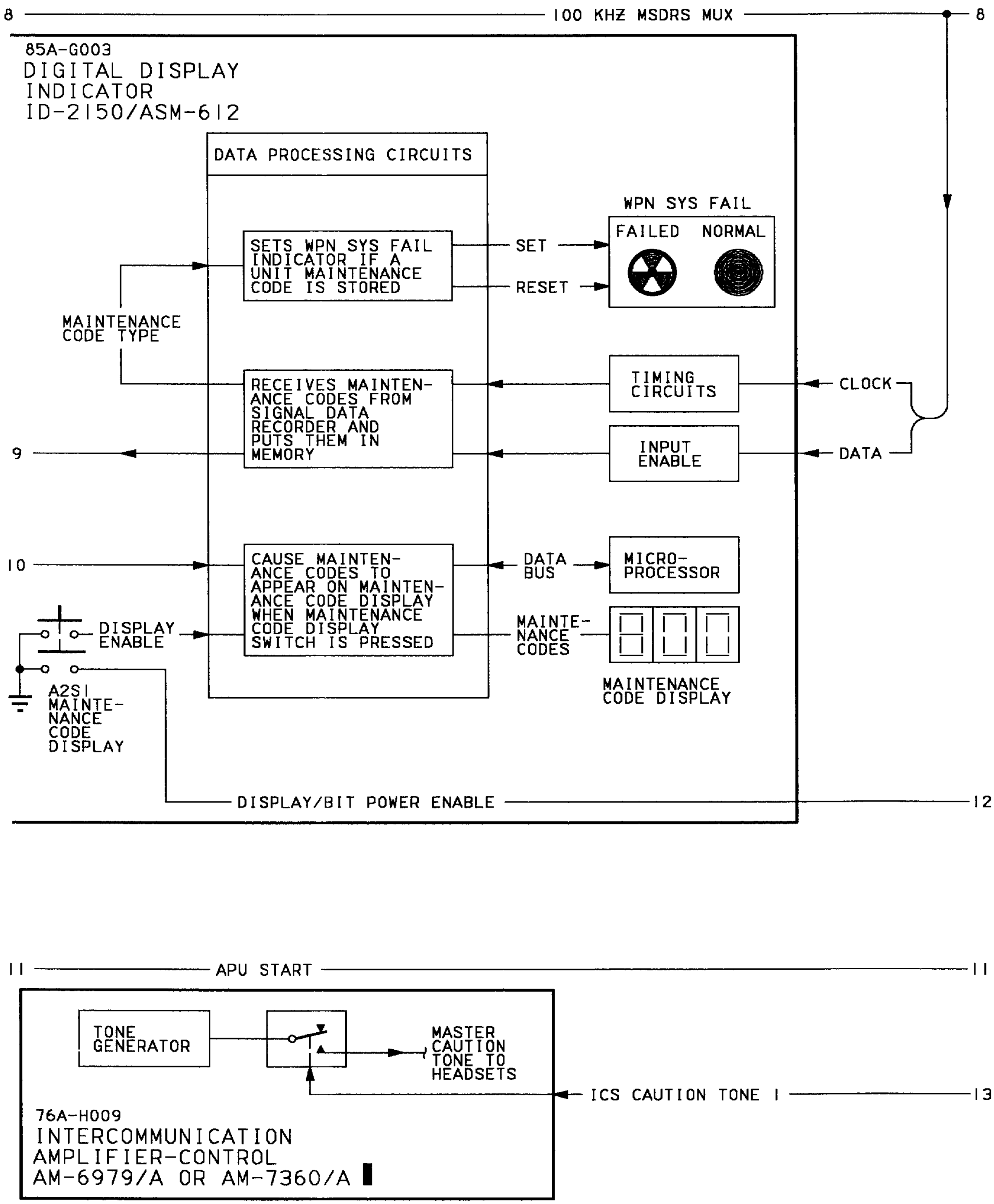
Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 5)



MAINT CODE	MAINTENANCE CODE MESSAGE
800	APU OVERSPEED
801	APU OVERHEAT
802	APU NO FLAME
804	APU START PERIOD TIMER TIMED OUT
805	APU FUEL SHUTOFF VALVE FAILED TO OPEN
816	LEFT AMAD OIL PRESSURE LOW
817	RIGHT AMAD OIL PRESSURE LOW
818	LEFT ATSCV OPEN
819	RIGHT ATCS OPEN
982	LEFT AMAD OIL LEVEL LOW
983	RIGHT AMAD OIL LEVEL LOW
984	APU OIL LEVEL LOW
988	FIRE EXTINGUISHER LOW

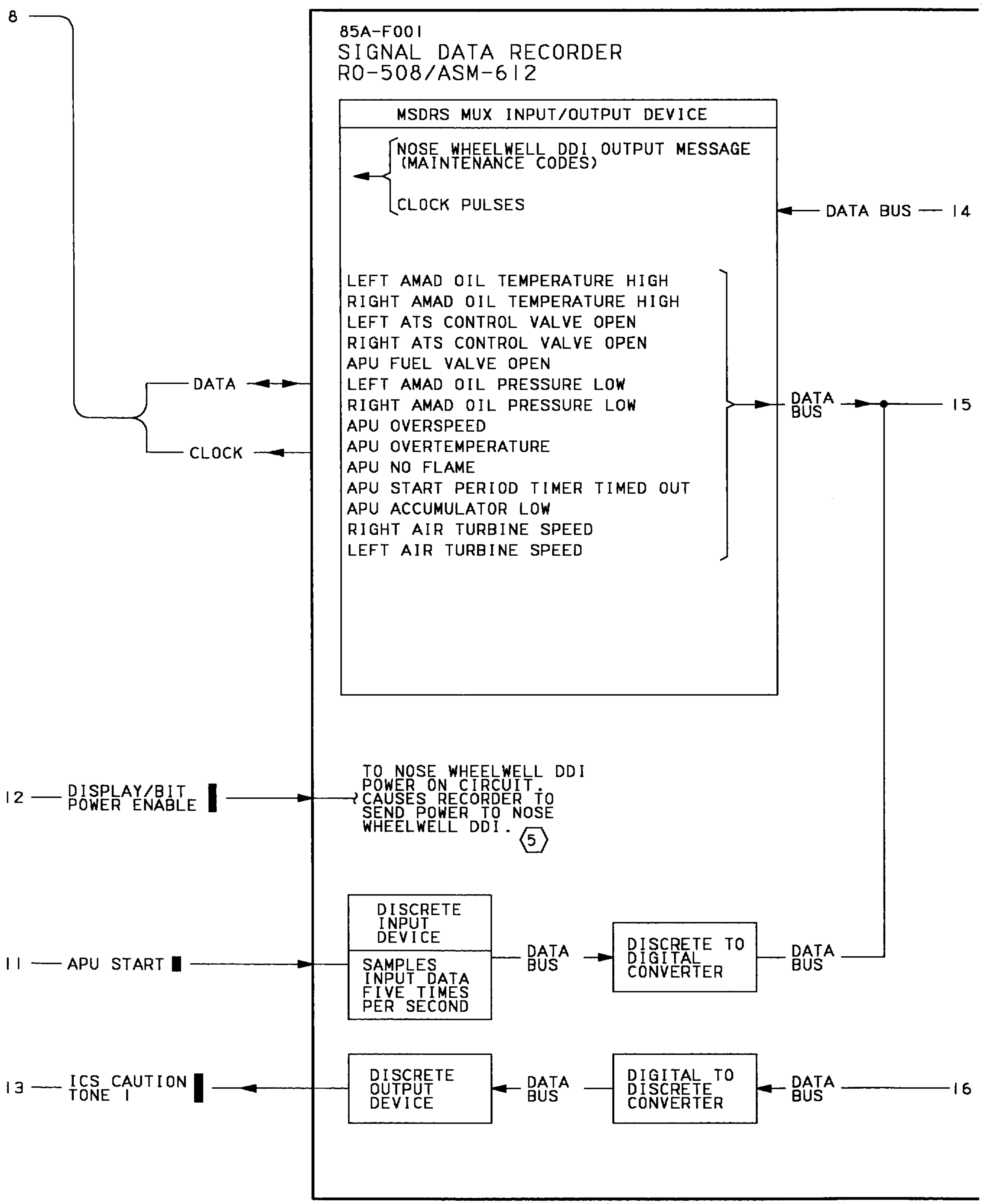
18AC-580-10-(16-6)C-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 6)



18AC-580-10-(16-7)13-GRID

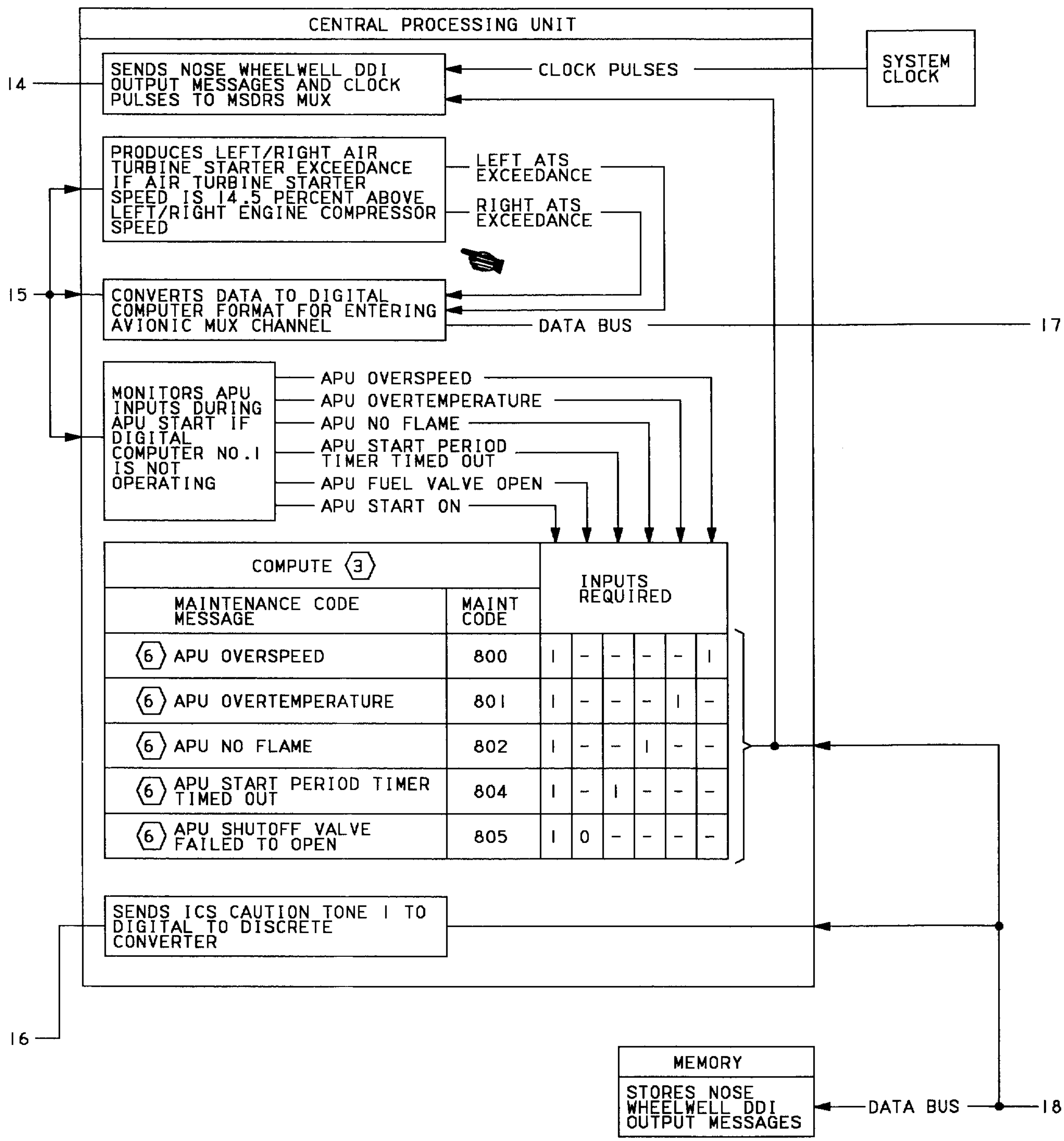
Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 7)



18AC-580-10-(16-8)C-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 8)

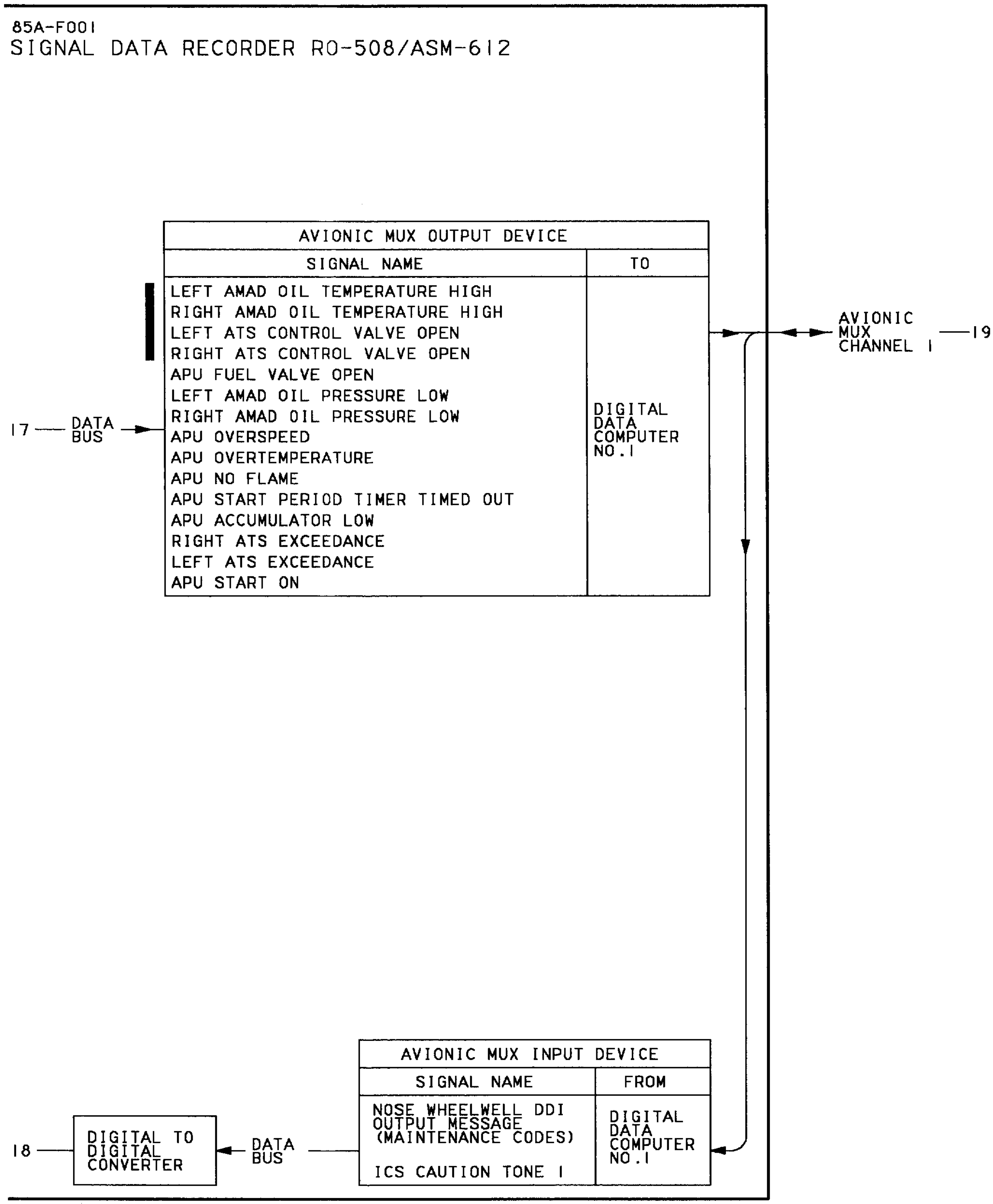
85A-F001
SIGNAL DATA RECORDER RO-508/ASM-612



COMPUTE ⟨3⟩		INPUTS REQUIRED					
MAINTENANCE CODE MESSAGE	MAINT CODE						
⟨6⟩ APU OVERSPEED	800	1	-	-	-	-	1
⟨6⟩ APU OVERTEMPERATURE	801	1	-	-	-	1	-
⟨6⟩ APU NO FLAME	802	1	-	-	1	-	-
⟨6⟩ APU START PERIOD TIMER TIMED OUT	804	1	-	1	-	-	-
⟨6⟩ APU SHUTOFF VALVE FAILED TO OPEN	805	1	0	-	-	-	-

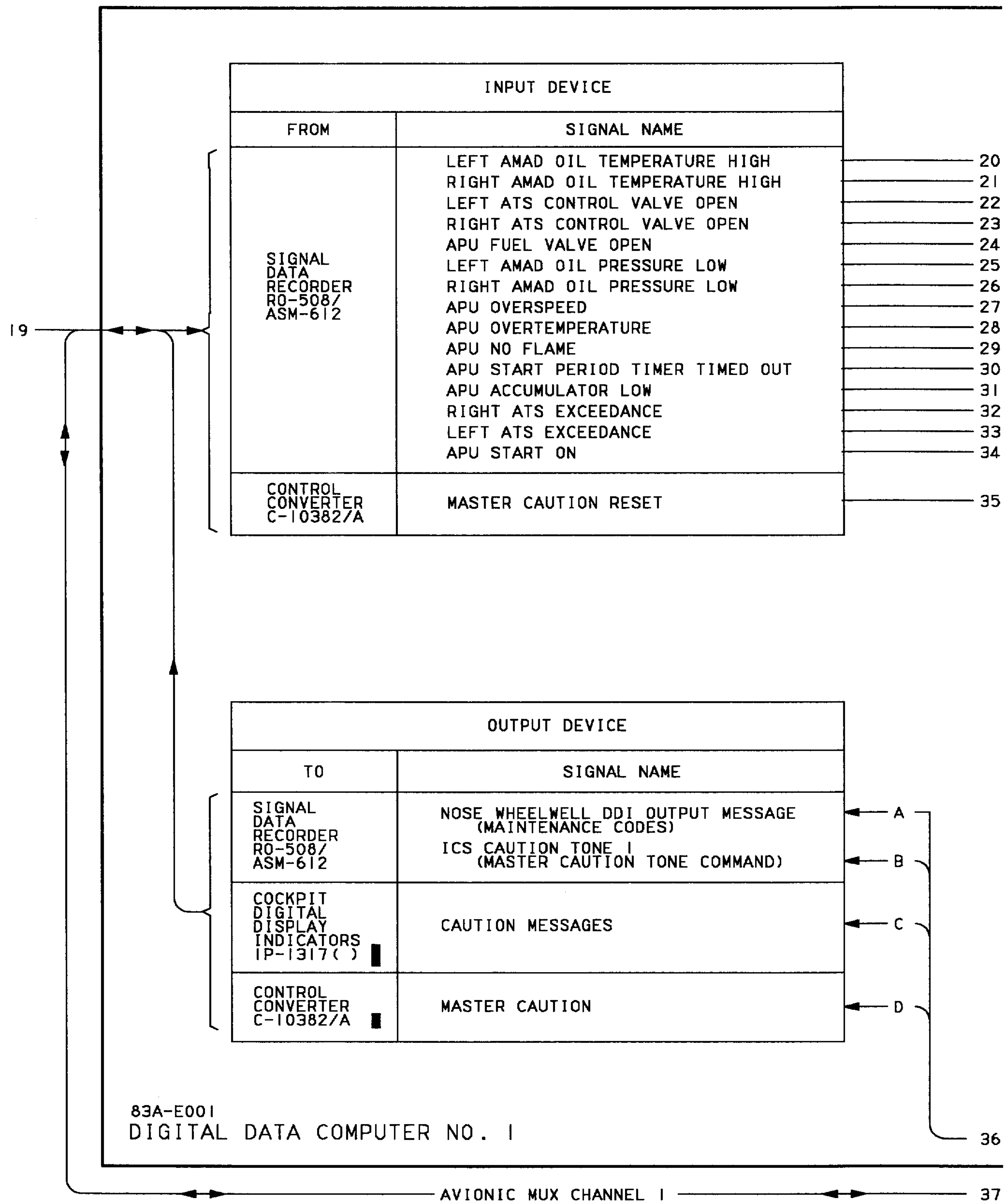
18AC-580-10-(16-9)D-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 9)



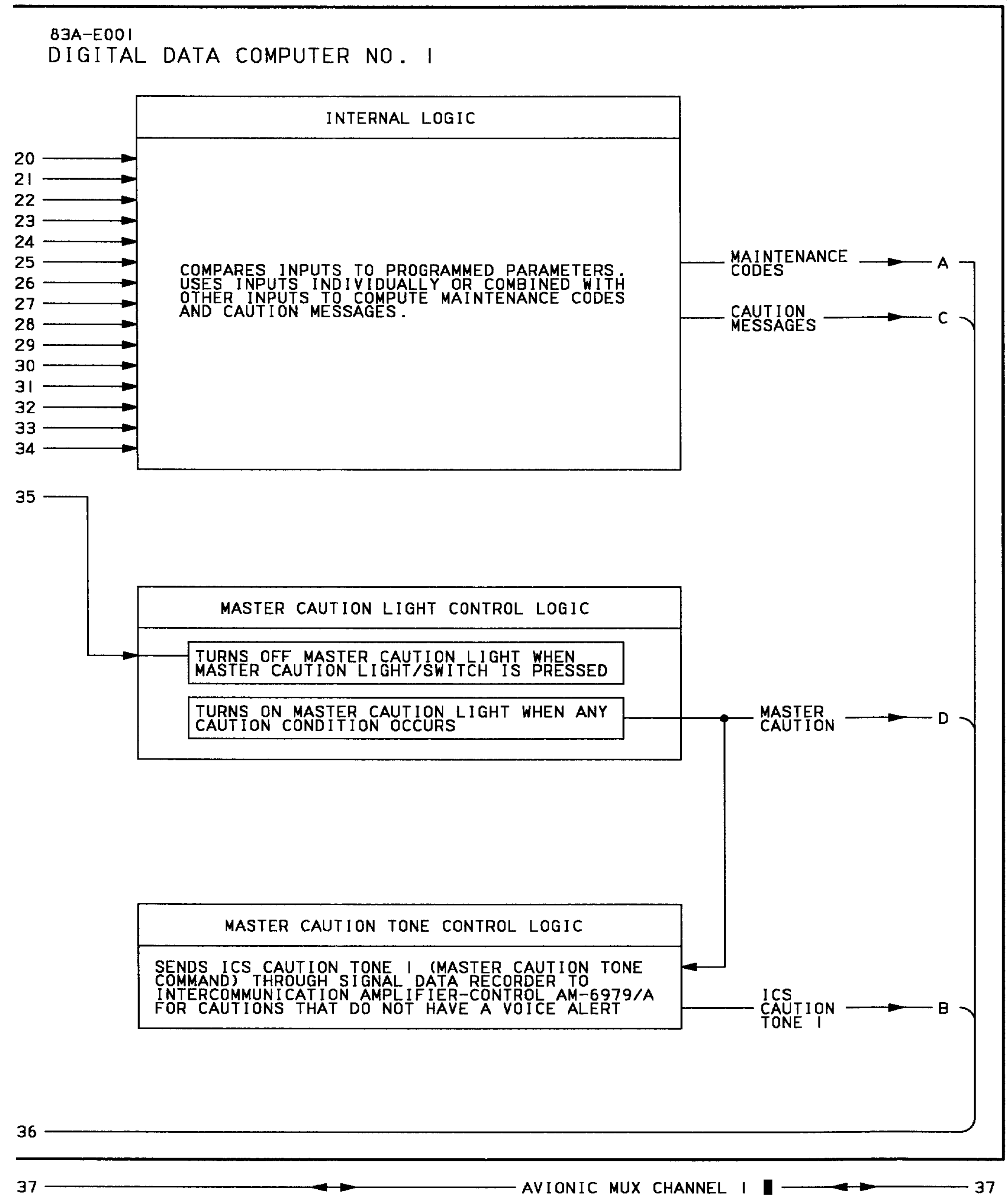
18AC-580-10-(16-10)C-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 10)



18AC-580-10-(16-11)D-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 11)



18AC-580-10-(16-12)C-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 12)

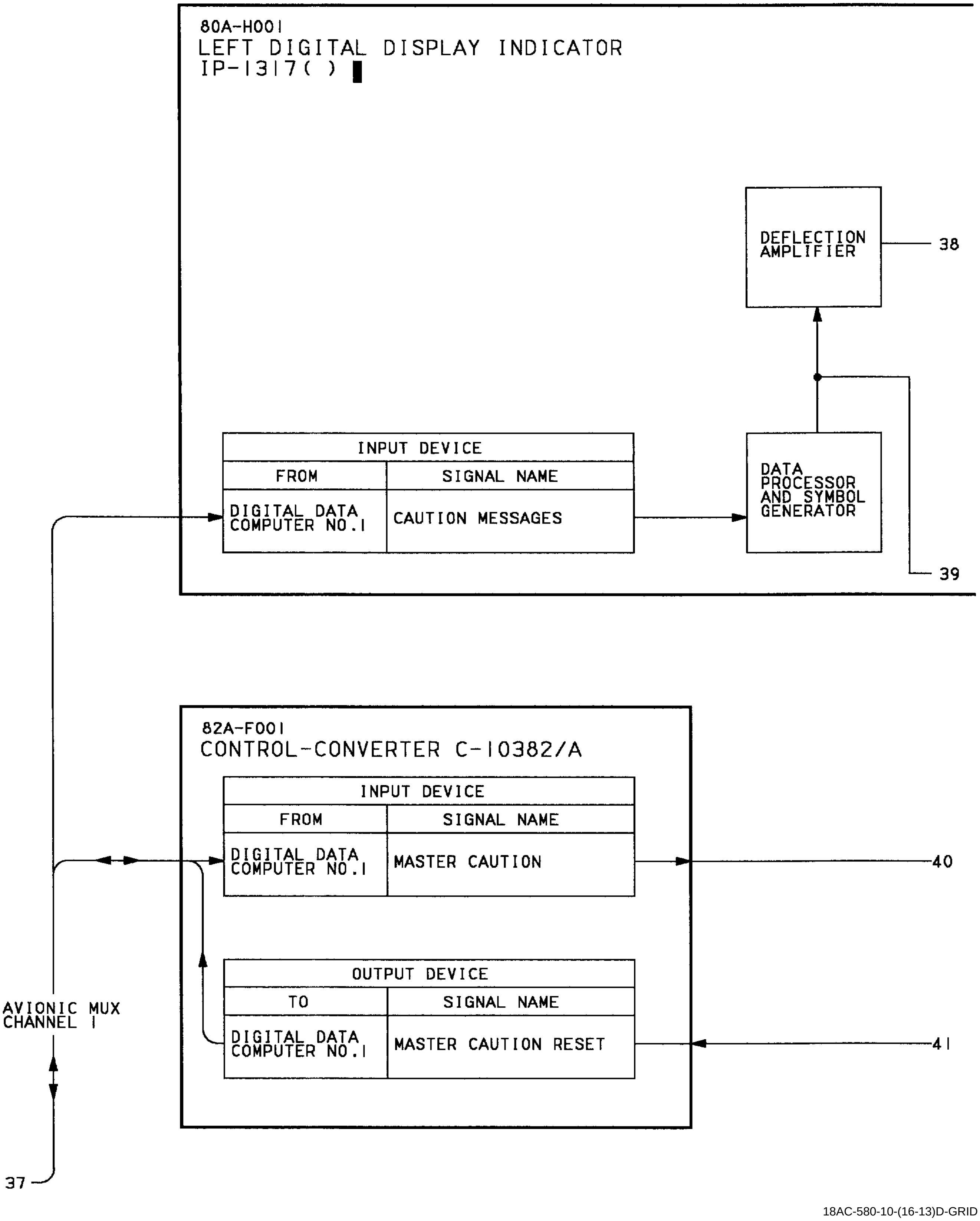
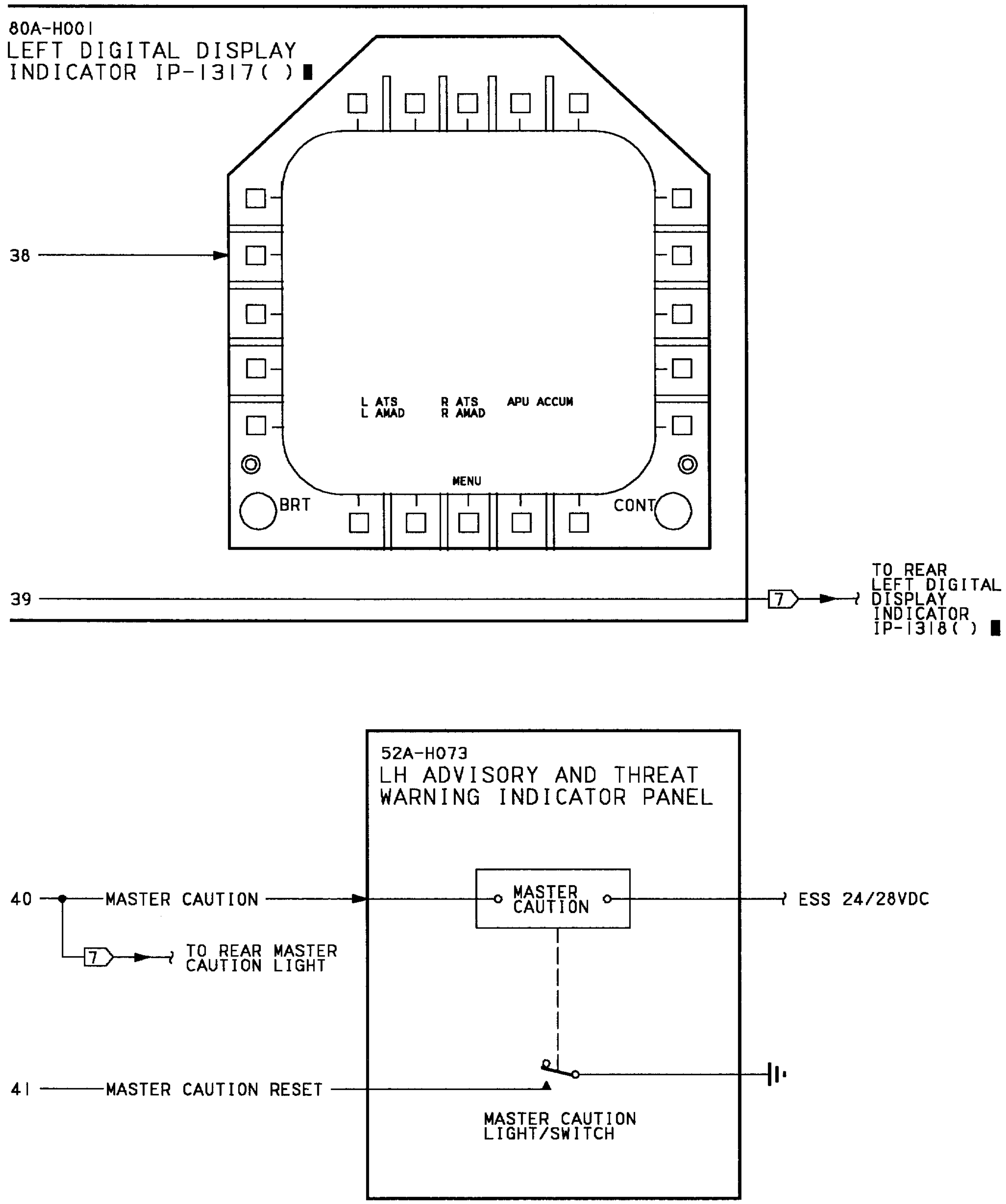


Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 13)

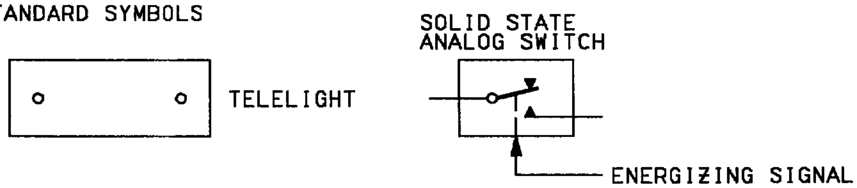


18AC-580-10-(16-14)D-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 14)

LEGEND

1. NONSTANDARD SYMBOLS



2 DELETED.

3 EXPLANATION OF MATRIX
   A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.
   B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.
   C. SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.
   D. INTERPRET MATRIX TABLE AS SHOWN:
      (1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.
      (2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.
      (3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

4 DIGITAL DISPLAY INDICATOR ID-2150/ASM-612 SIMPLIFIED SCHEMATIC, WP014 00.

5 SIMPLIFIED POWER SCHEMATIC, WP006 00.

6 DURING APU START MODE, IF MISSION COMPUTER SYSTEM IS OPERATING, APU START DATA IS SENT TO MISSION COMPUTER SYSTEM FOR COMPUTATION OF APU MAINTENANCE CODES. IF MISSION COMPUTER SYSTEM IS NOT OPERATING, SIGNAL DATA RECORDER COMPUTES APU MAINTENANCE CODES.

7 F/A-18B.

8 161353 THRU 161528 BEFORE F18 AFC 26.

9 161702 AND UP; ALSO 161353 THRU 161528 AFTER F18 AFC 26.

10 161353 THRU 161519 BEFORE F18 AFC 27.

11 161520 AND UP; ALSO 161353 THRU 161519 AFTER F18 AFC 27.

12 PART NUMBER 74B 548017-105.

13 PART NUMBER 74B 548017-109.

18AC-580-10-(16-15)D-GRID

Figure 1. Secondary Power System Interface Simplified Schematic (Sheet 15)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - CANOPY, WINGFOLD, BOARDING LADDER, PITOT STATIC, GUN, ANTI-ICING AND AIR INDUCTION SYSTEMS INTERFACE

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

Reference Material

None

Alphabetical Index

Record of Applicable Technical Directives

None

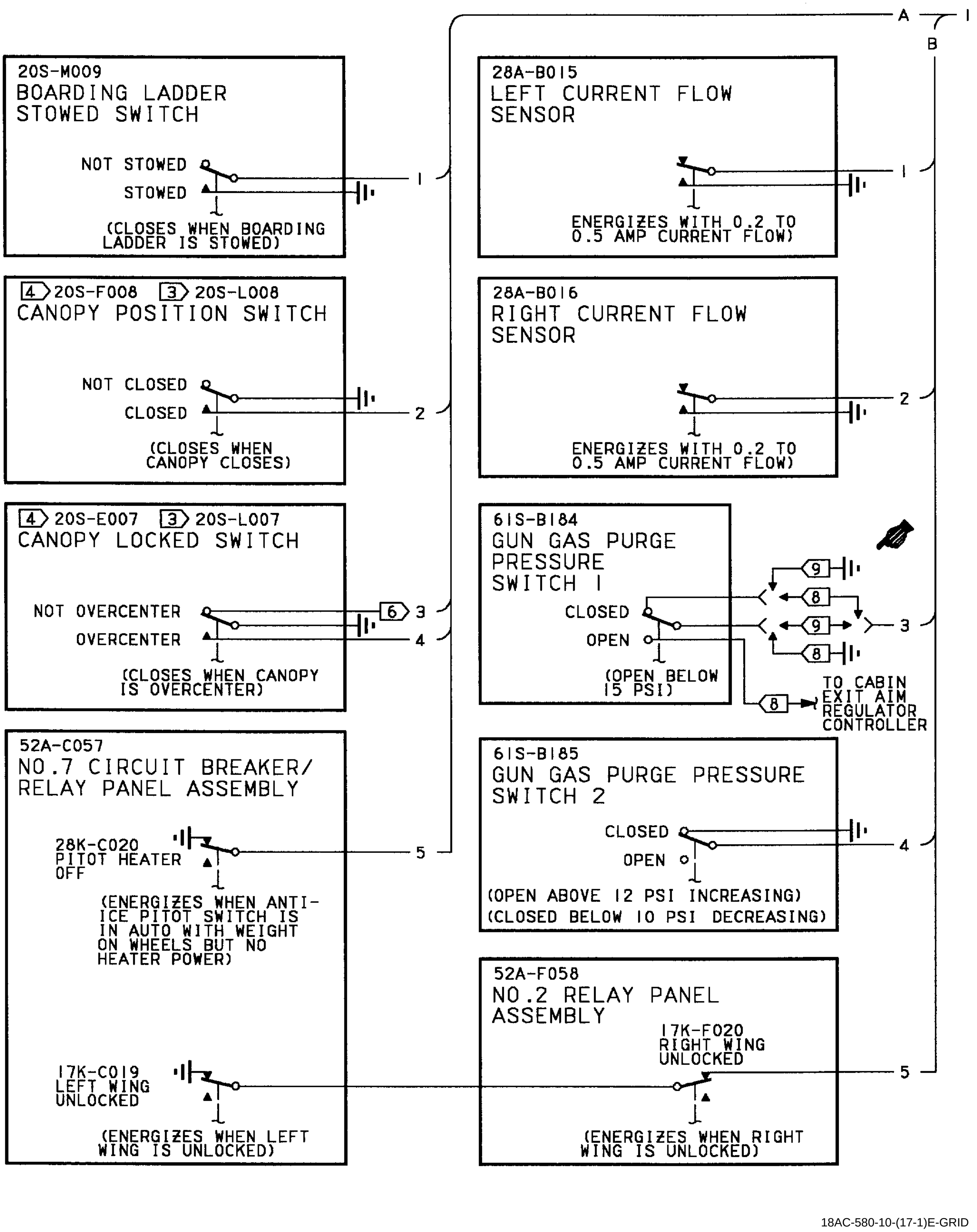


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 1)

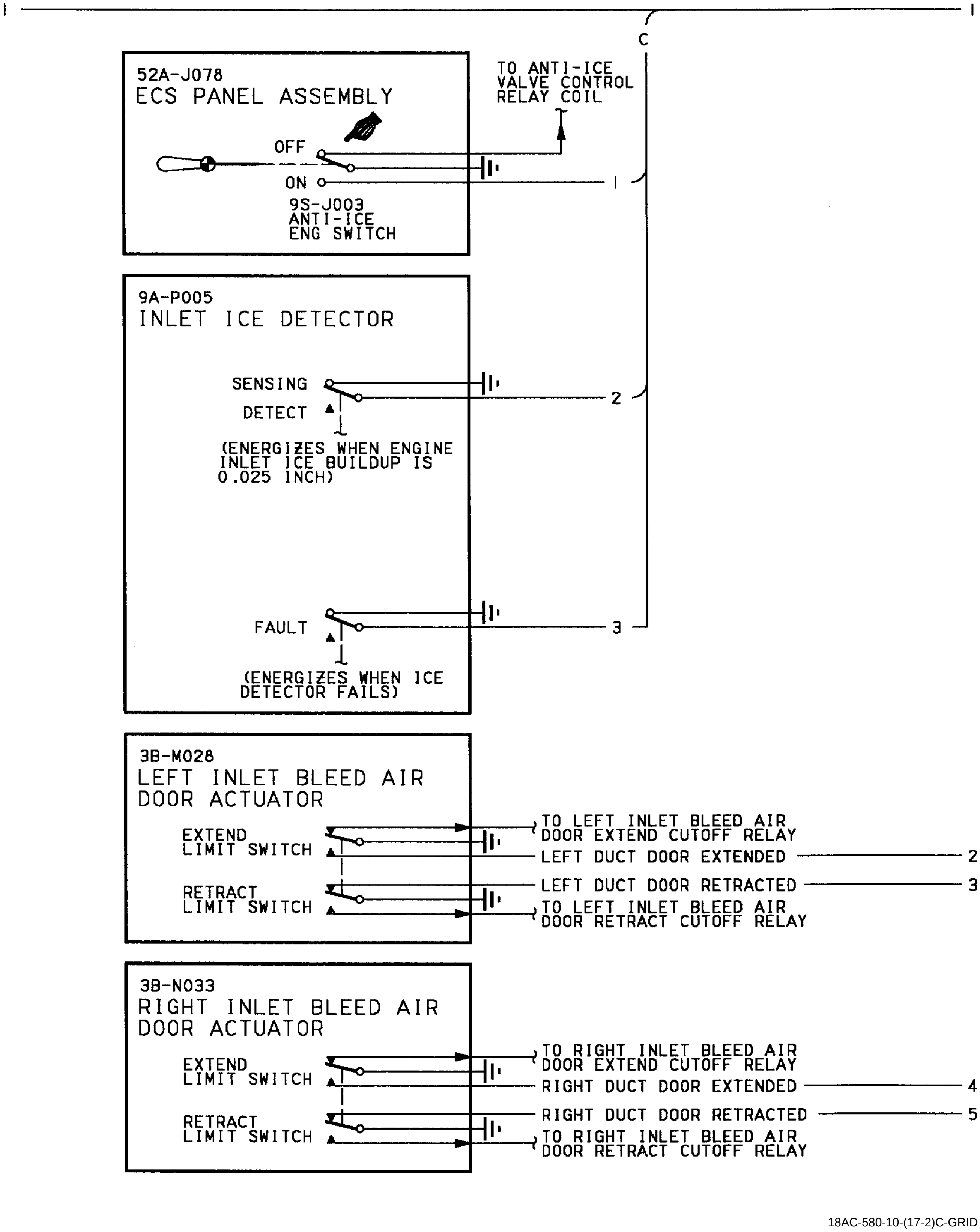


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 2)

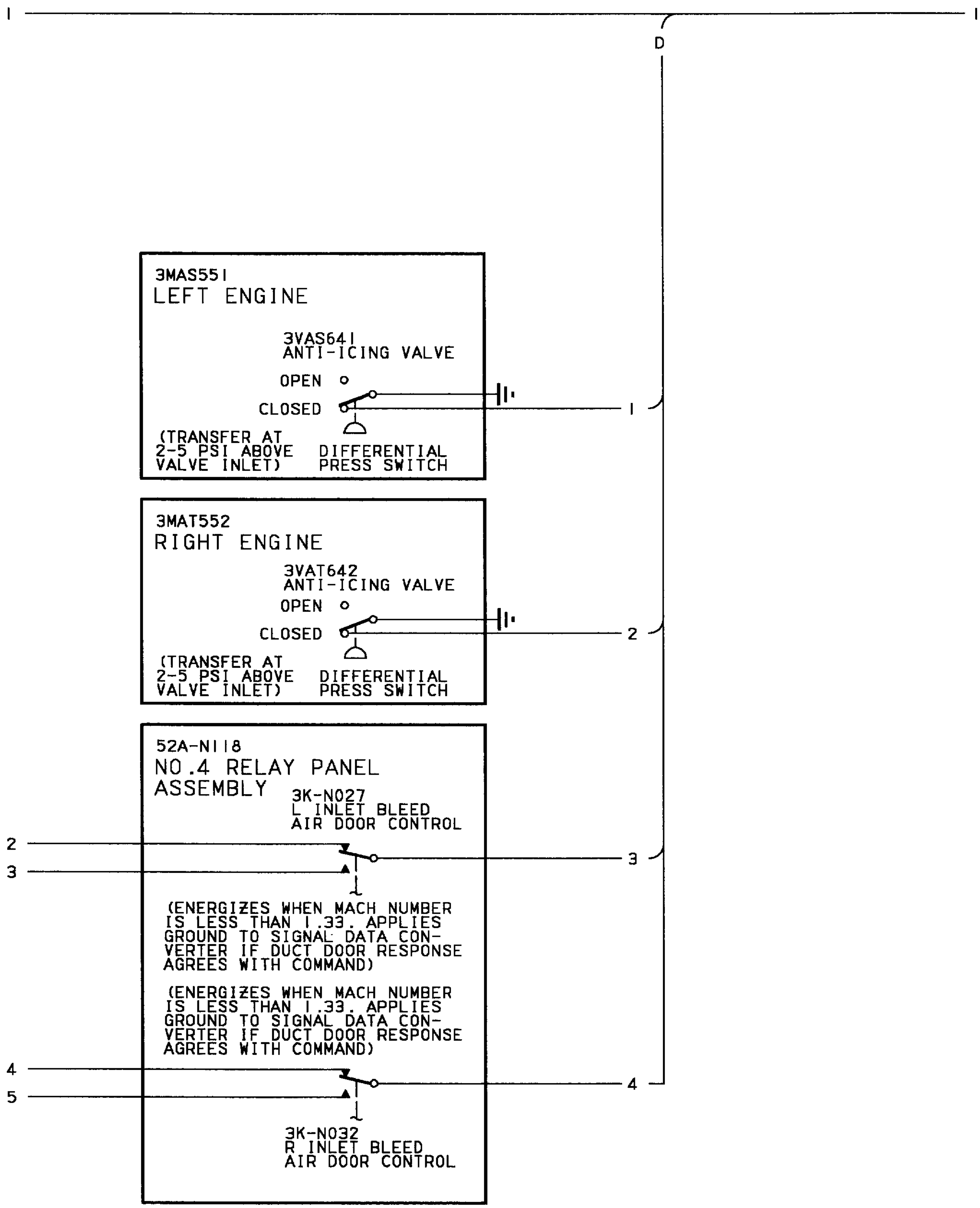
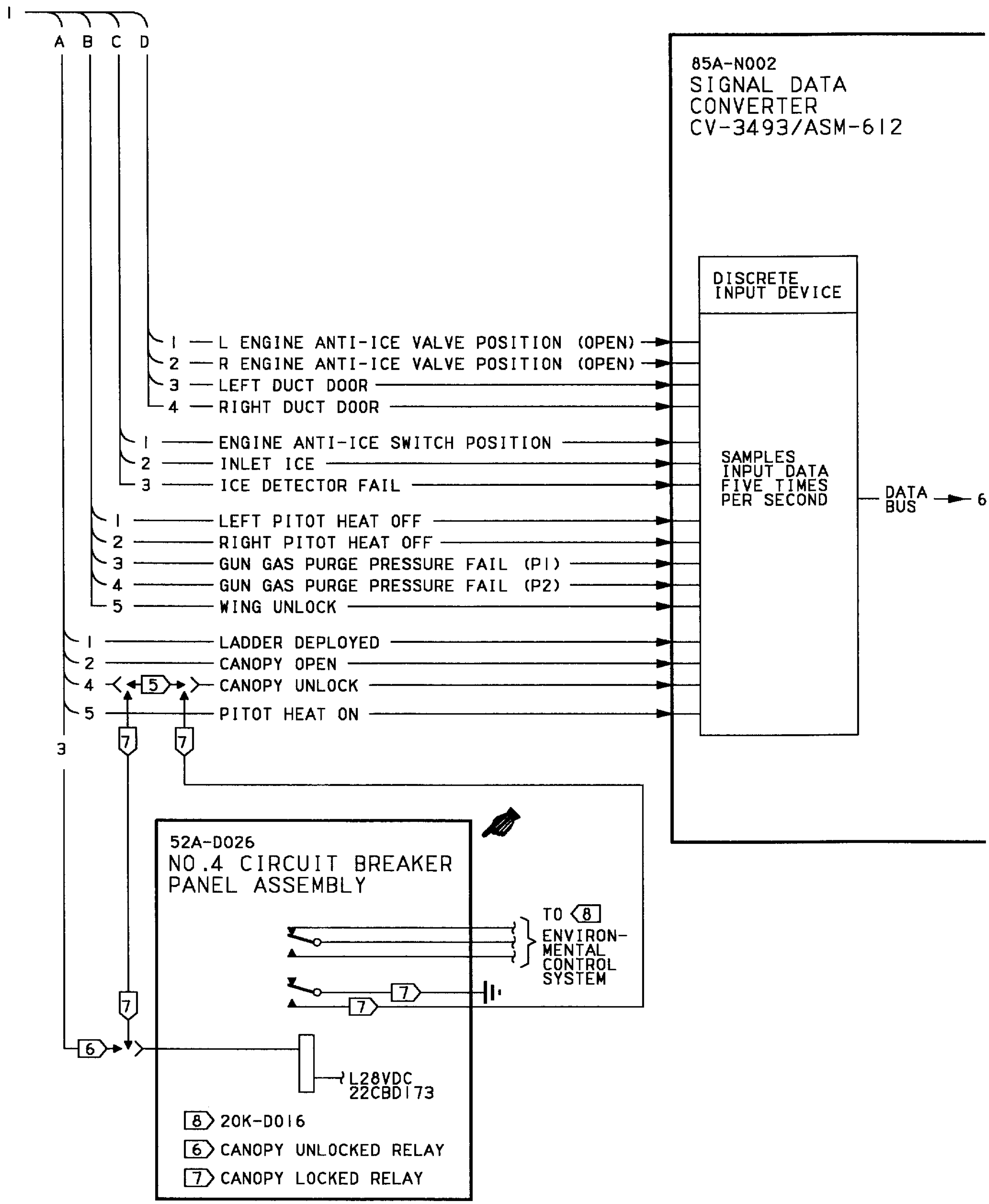


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 3)



18AC-580-10-(17-4)D-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 4)

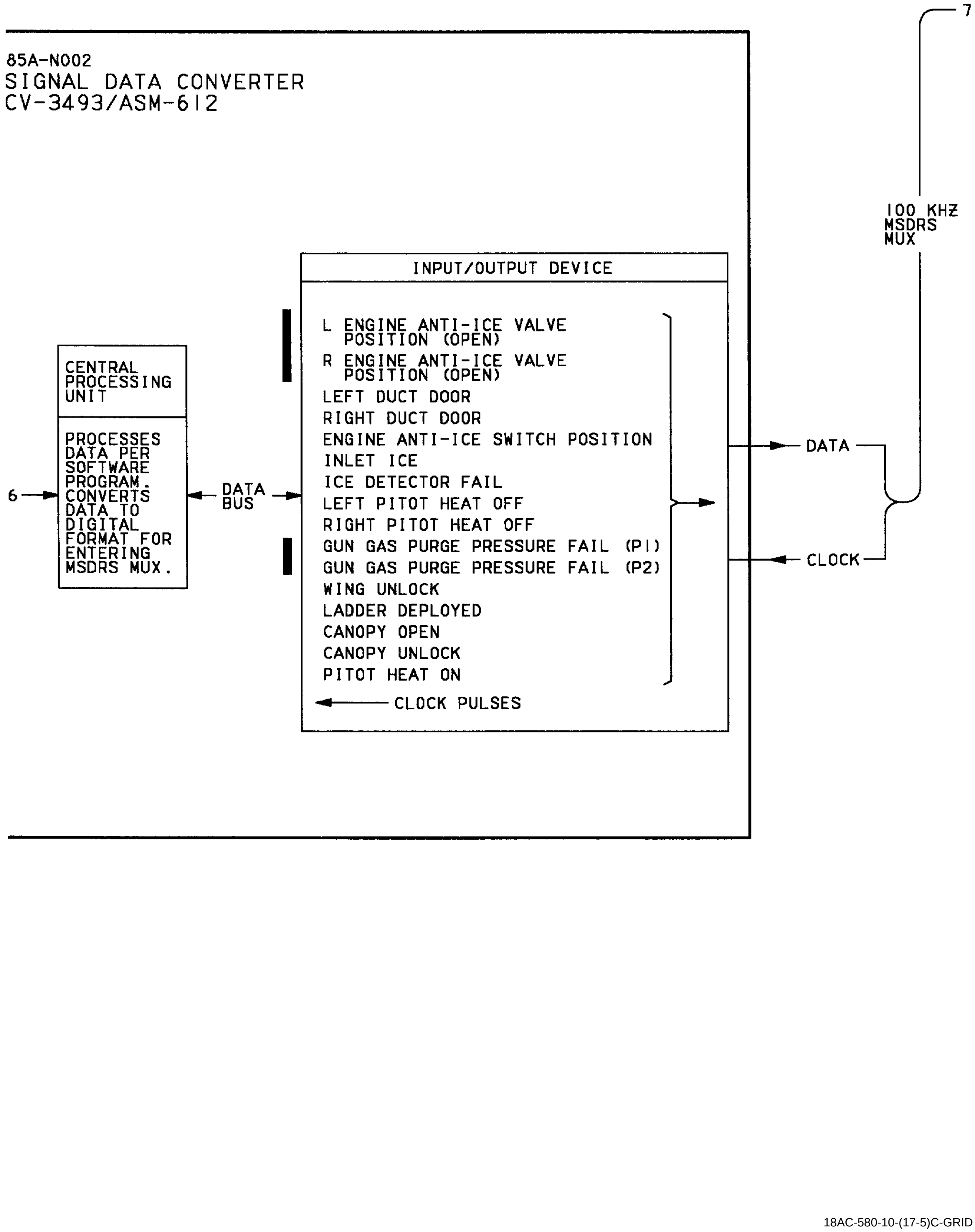
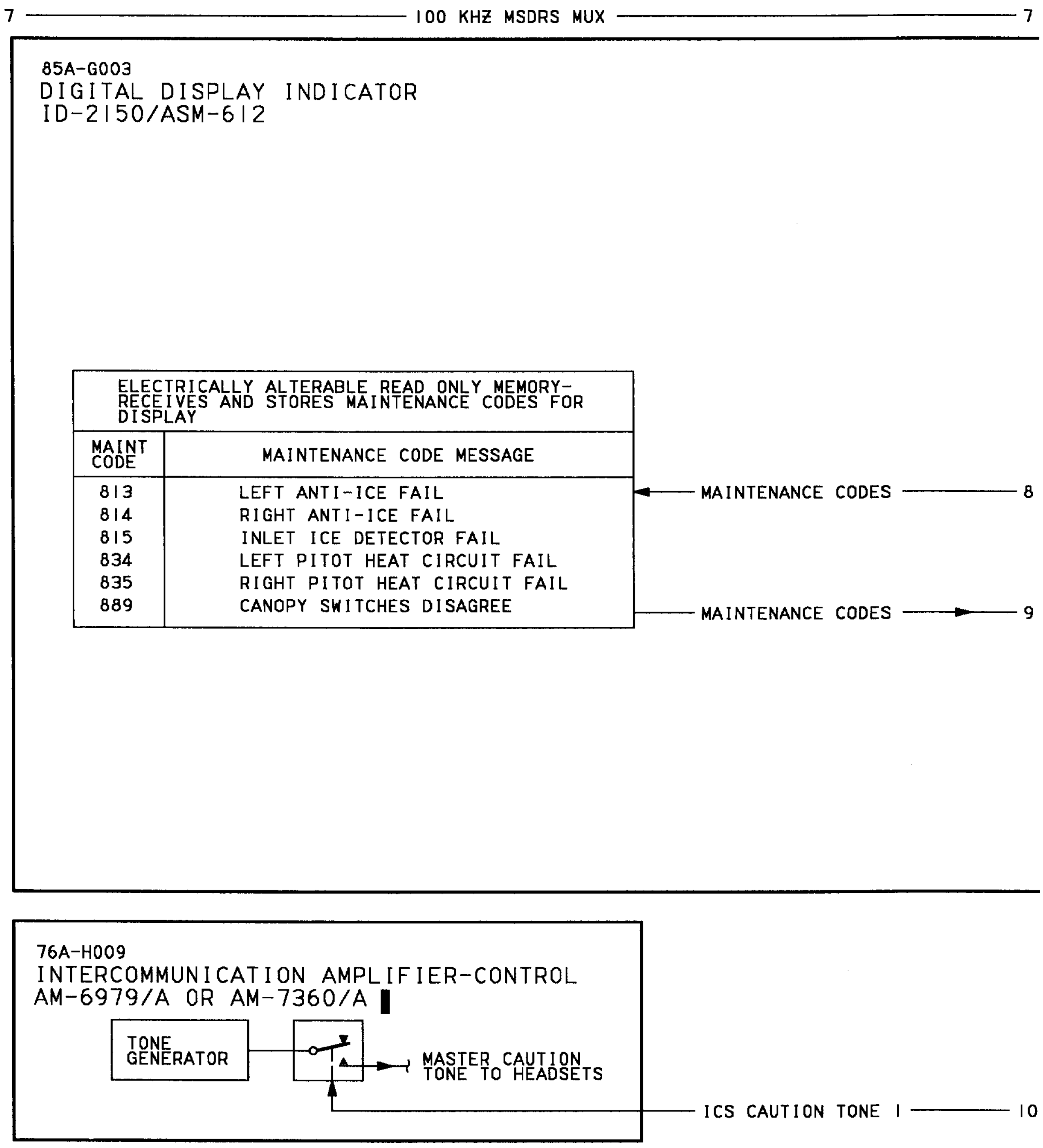


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 5)



MAINT CODE	MAINTENANCE CODE MESSAGE
813	LEFT ANTI-ICE FAIL
814	RIGHT ANTI-ICE FAIL
815	INLET ICE DETECTOR FAIL
834	LEFT PITOT HEAT CIRCUIT FAIL
835	RIGHT PITOT HEAT CIRCUIT FAIL
889	CANOPY SWITCHES DISAGREE

18AC-580-10-(17-6)13-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 6)

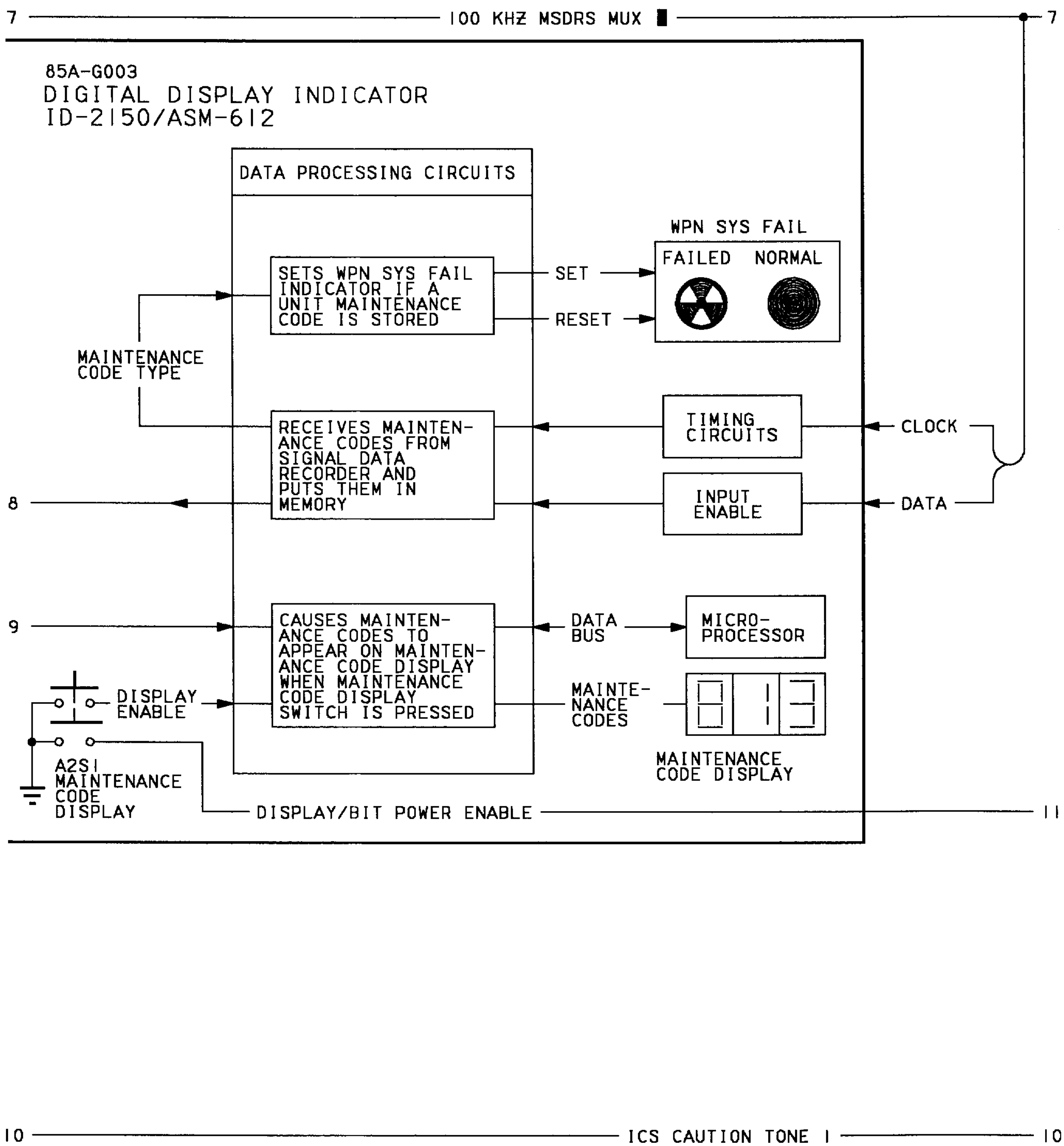
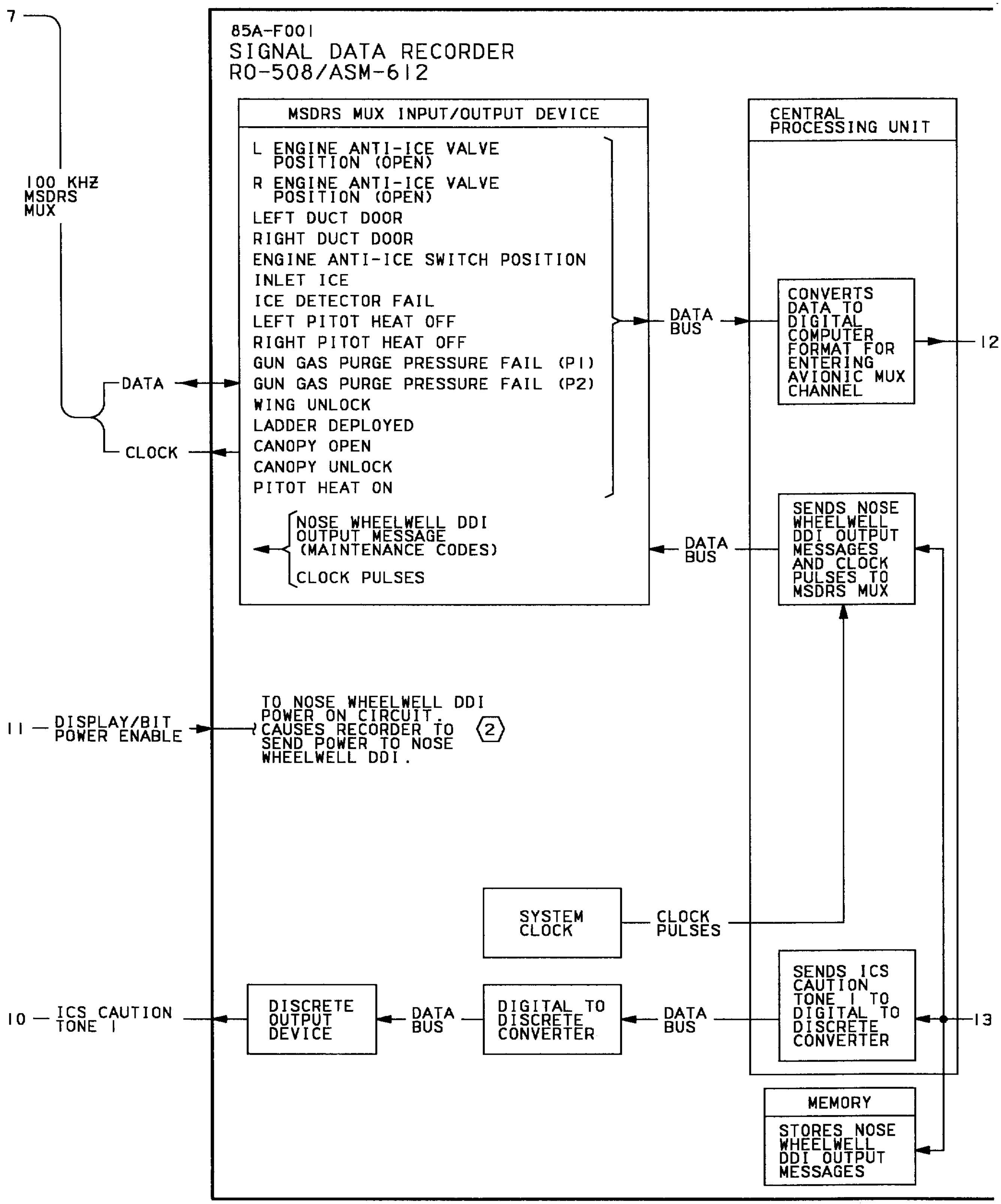
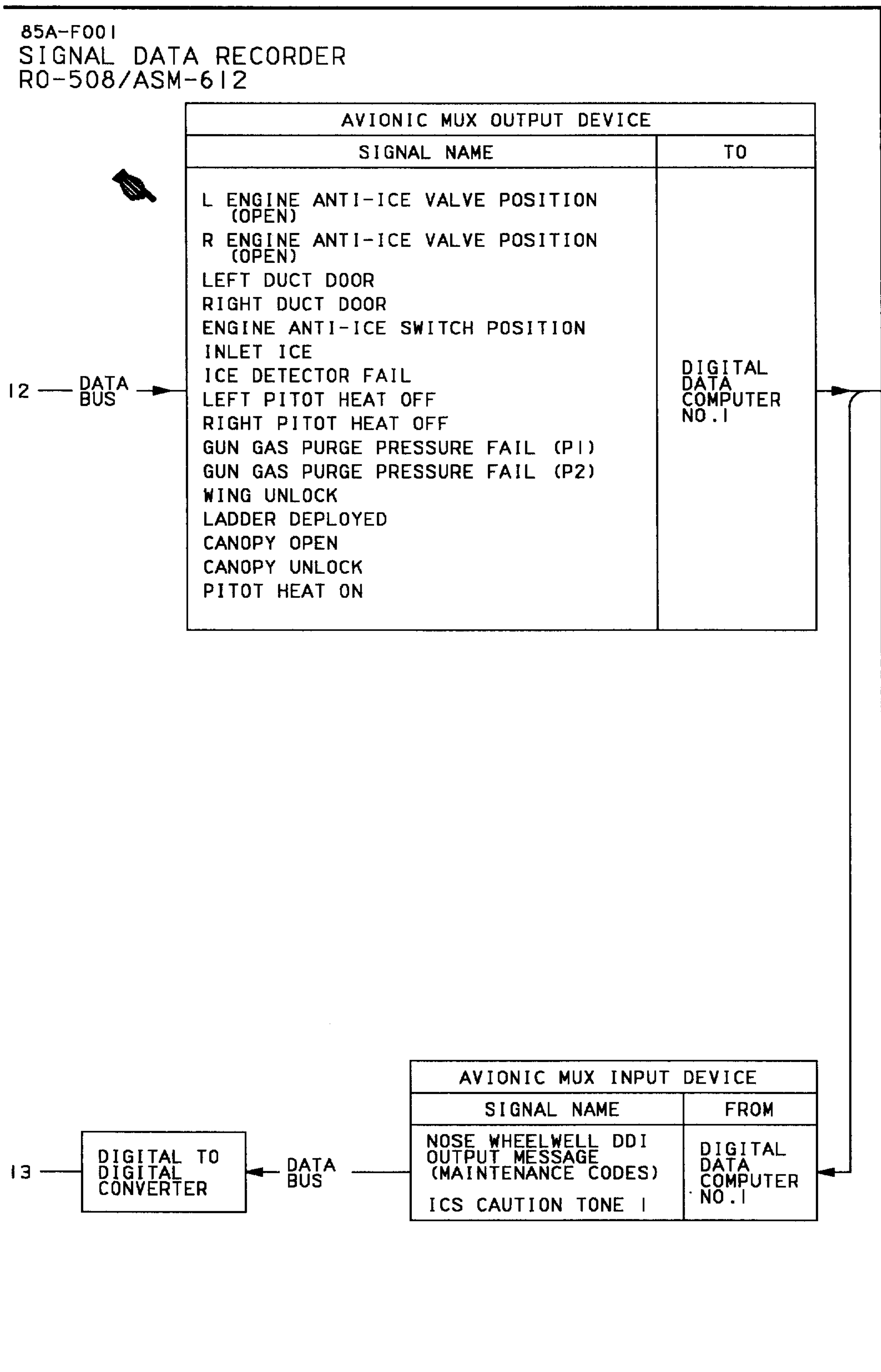


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 7)



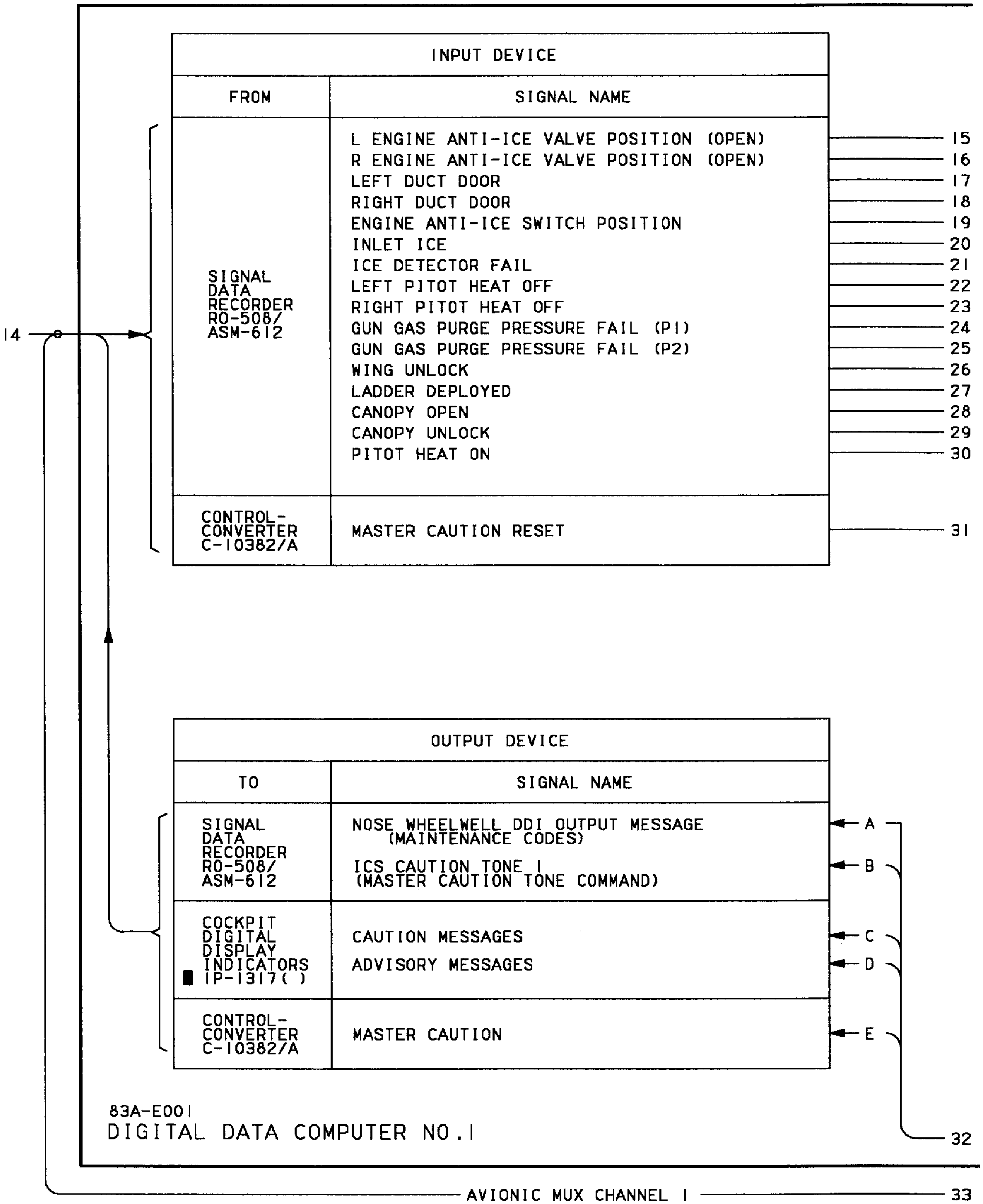
18AC-580-10-(17-8)D-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 8)



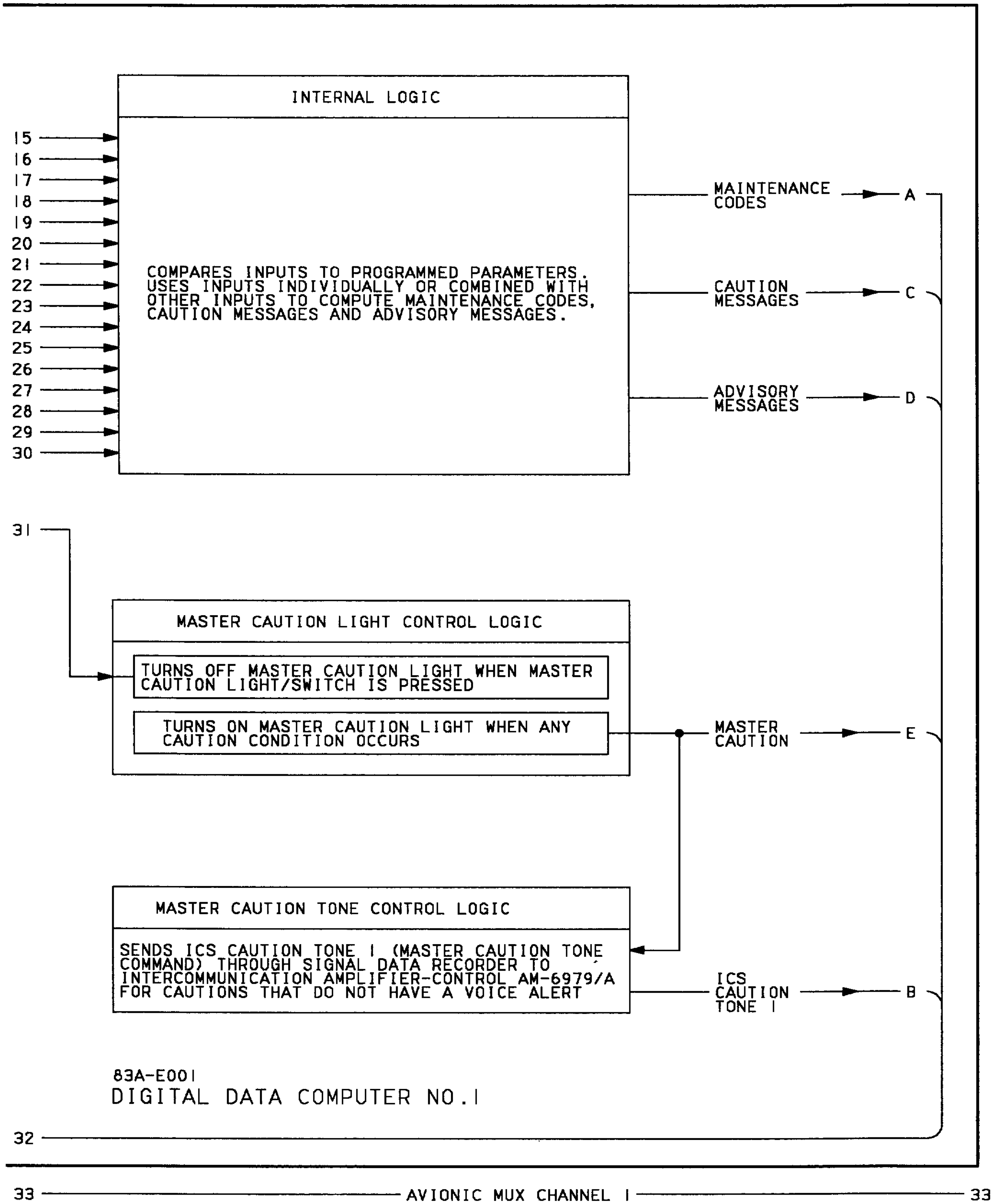
18AC-580-10-(17-9)C-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 9)



18AC-580-10-(17-10)D-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 10)



18AC-580-10-(17-11)C-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 11)

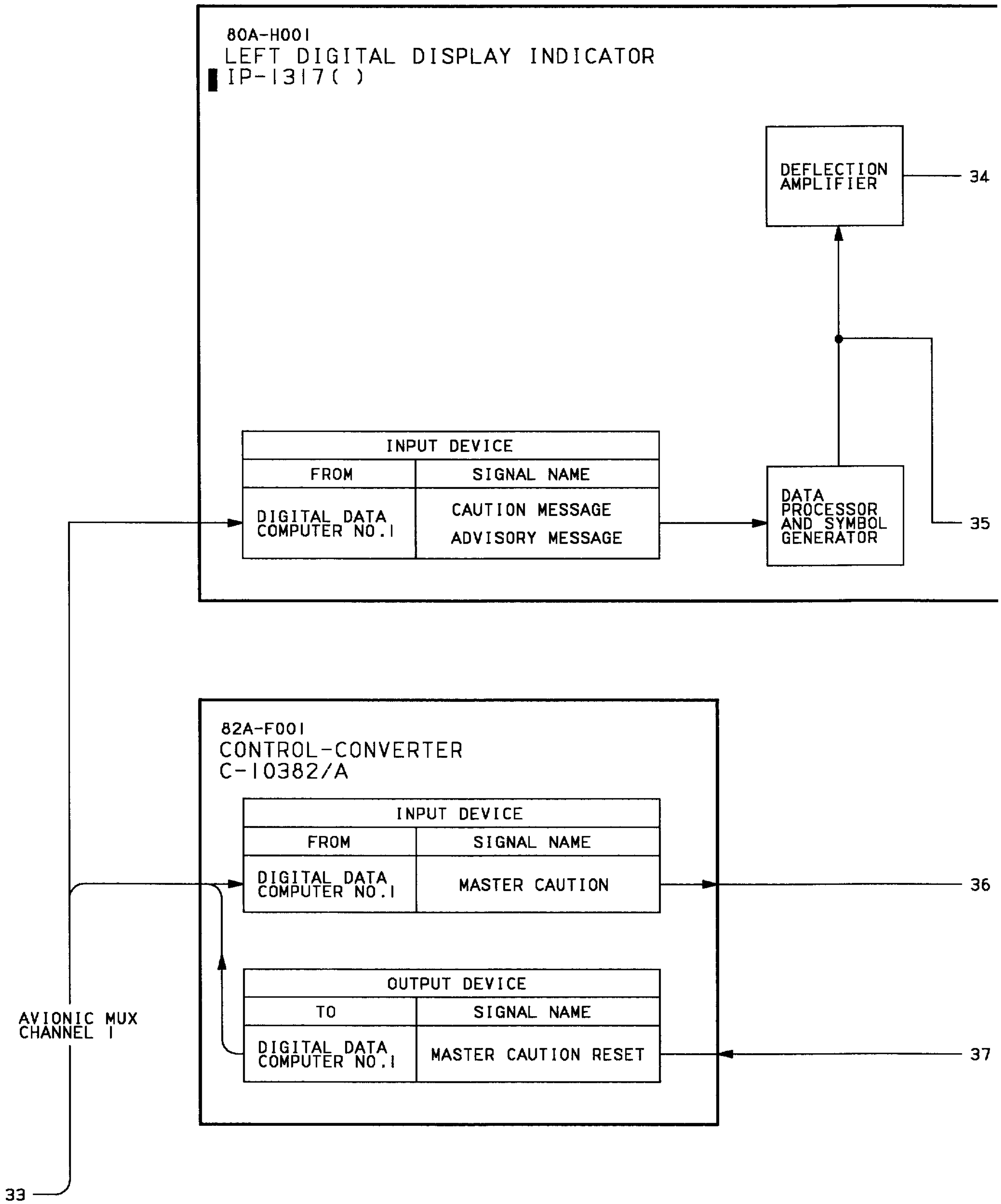
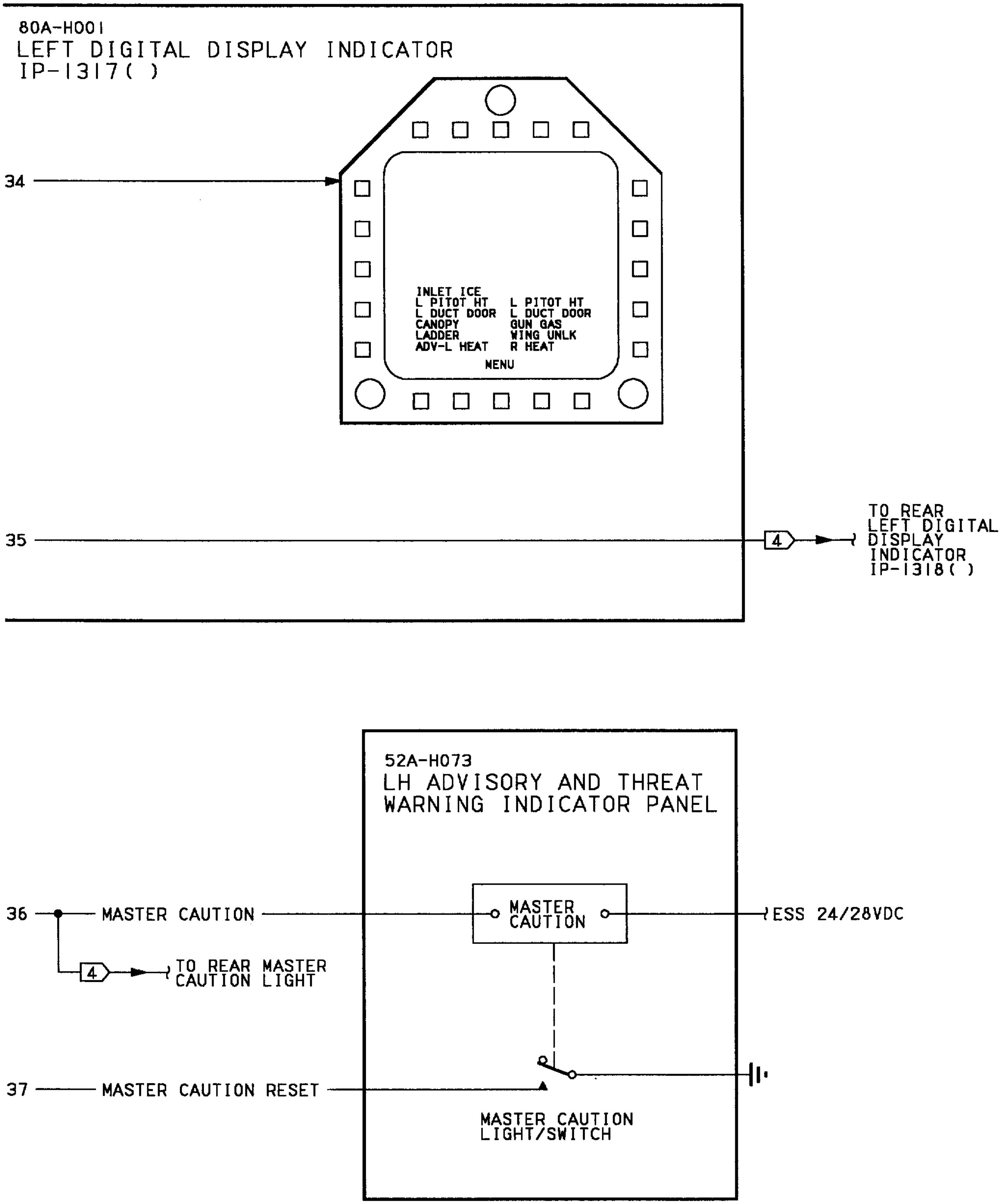


Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 12)

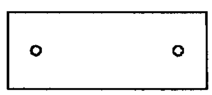


18AC-580-10-(17-13)13-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 13)

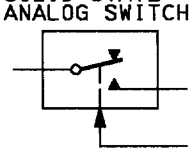
LEGEND

1. NONSTANDARD SYMBOLS



TELELIGHT

SOLID STATE
ANALOG SWITCH



ENERGIZING SIGNAL

⟨2⟩ SIMPLIFIED POWER SCHEMATIC, WP006 00.

[3> F/A-18A.

[4> F/A-18B.

[5> F/A-18A; F/A-18B 161354 THRU 162885.

[6> F/A-18A 163092 AND UP.

[7> F/A-18B 163104 AND UP.

[8> 163092 AND UP.

[9> 161353 THRU 162909.

18AC-580-10-(17-14)E-GRID

Figure 1. Canopy, Wingfold, Boarding Ladder, Pitot Static, Gun, Anit-Icing and Air Induction Systems Interface Simplified Schematic (Sheet 14)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - MAINTENANCE CODE CLEAR AND INHIBIT

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: WITH DIGITAL DATA COMPUTER NO. 1 CONFIG/IDENT NUMBER 84A AND UP

This WP supersedes WP023 00, dated 15 June 1986.

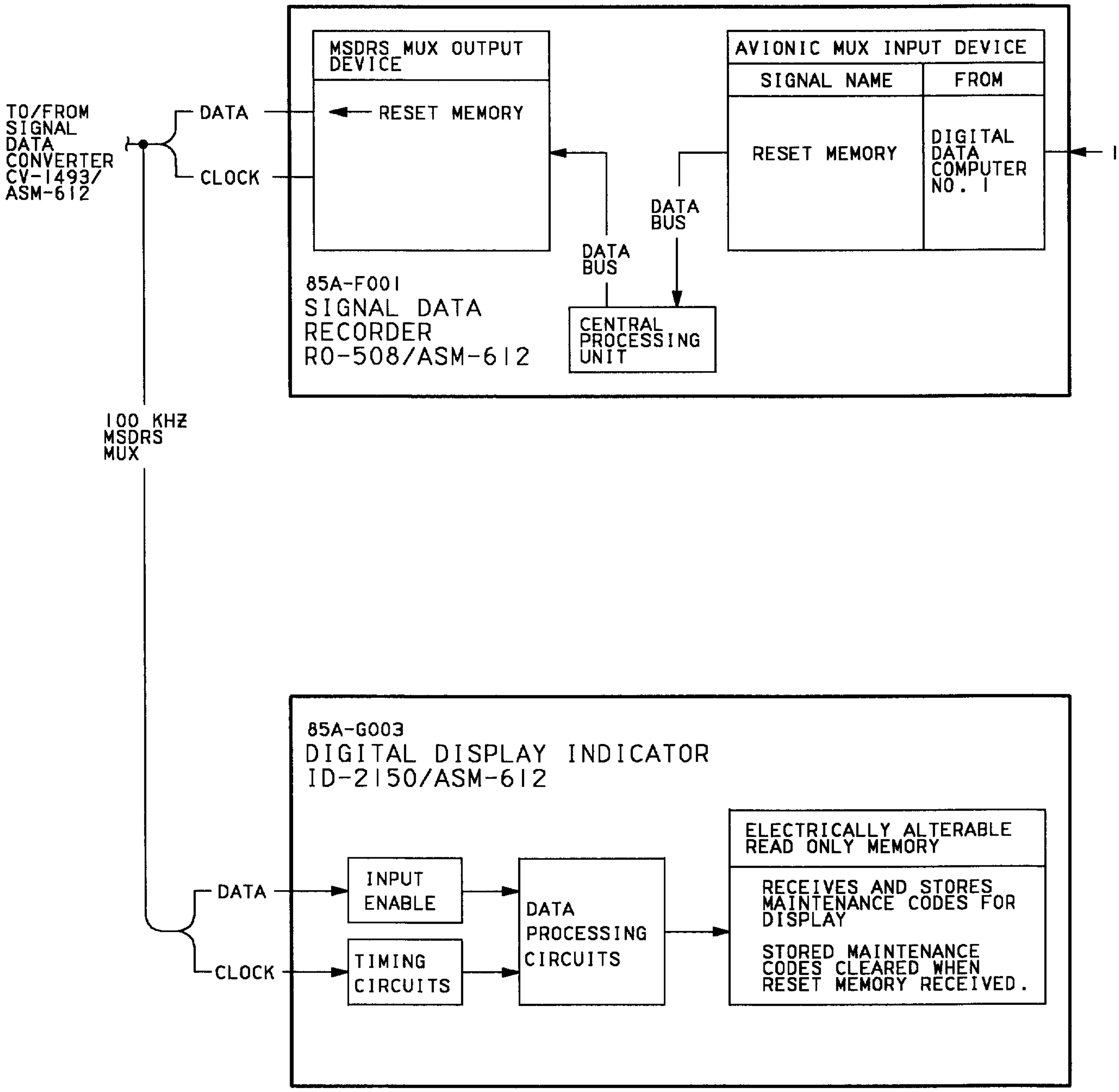
Reference Material

None

Alphabetical Index

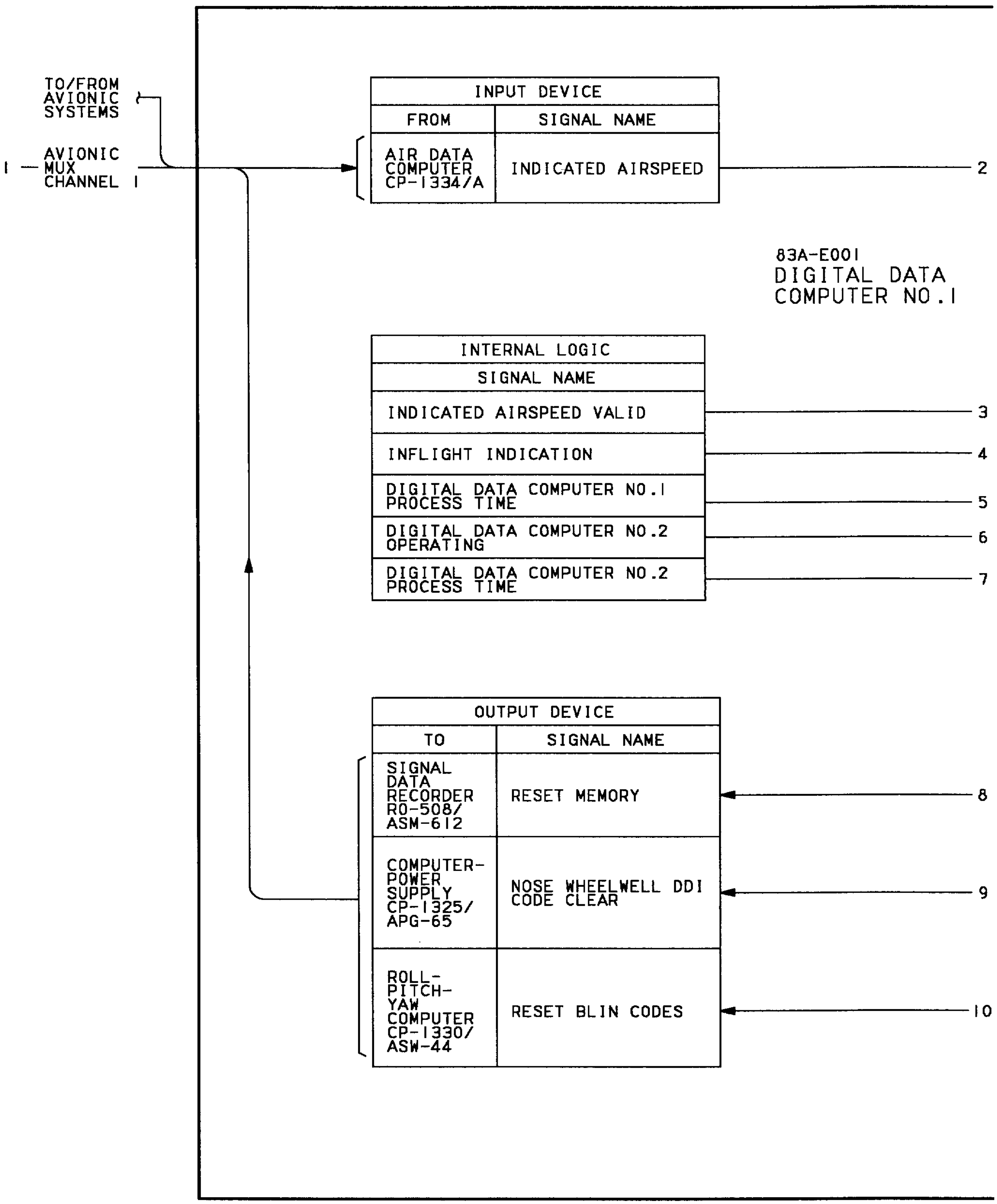
Record of Applicable Technical Directives

None



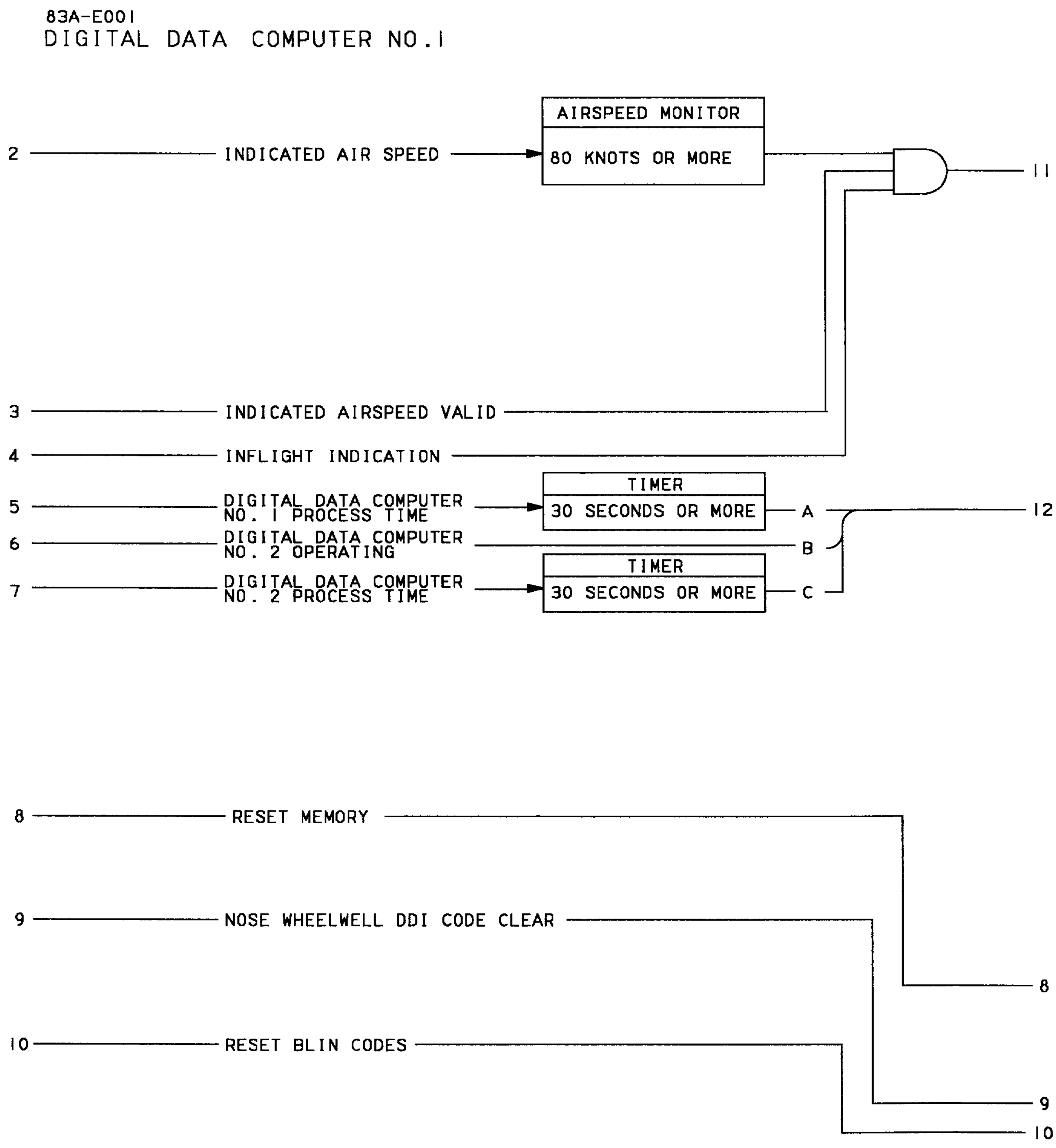
18AC-580-10-(20-1)A-GRID

Figure 1. Maintenance Code Clear and Inhibit Simplified Schematic (Sheet 1)



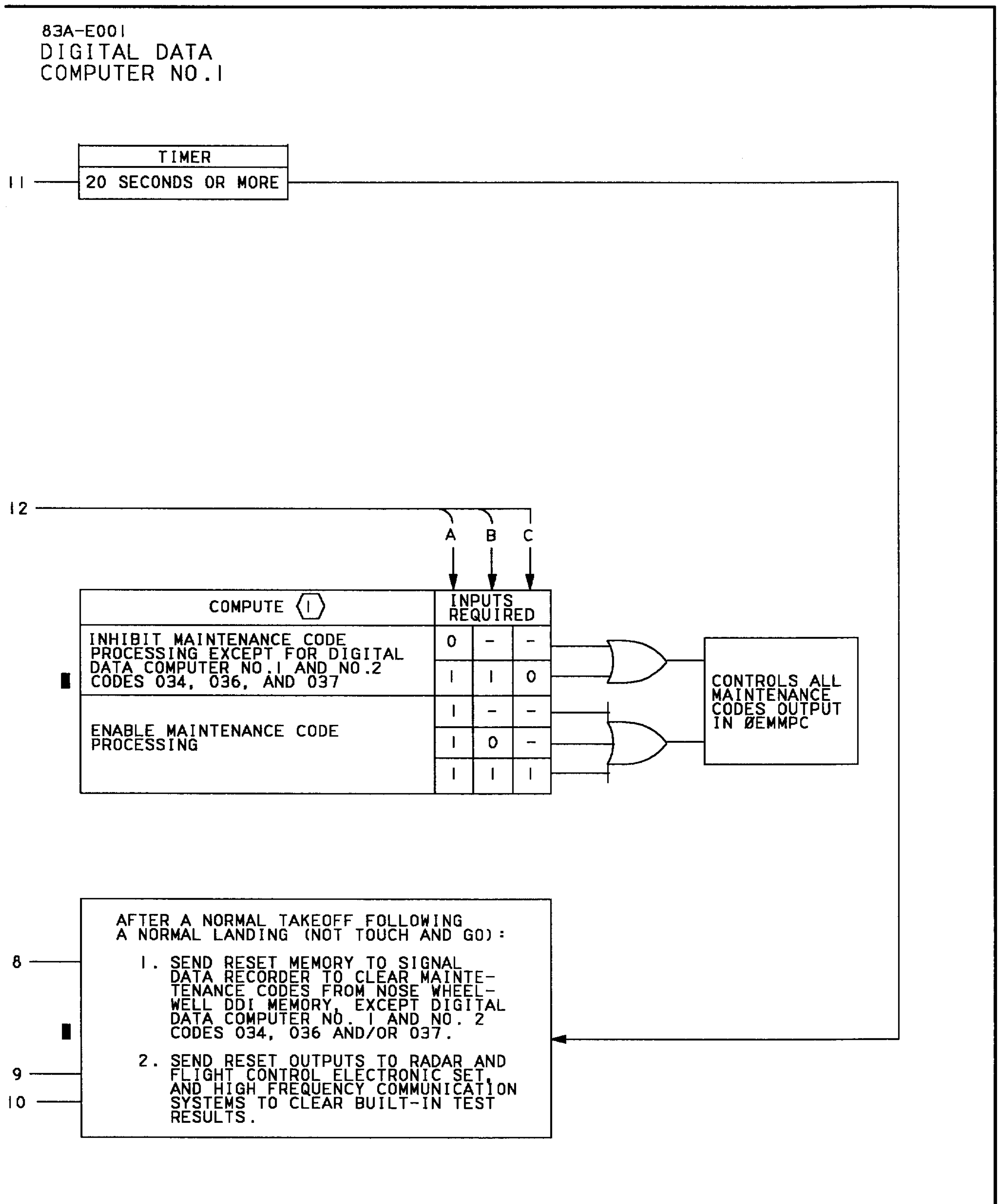
18AC-580-10-(20-2)B-GRID

Figure 1. Maintenance Code Clear and Inhibit Simplified Schematic (Sheet 2)



18AC-580-10-(20-3)A-GRID

Figure 1. Maintenance Code Clear and Inhibit Simplified Schematic (Sheet 3)



18AC-580-10-(20-4)C-GRID

Figure 1. Maintenance Code Clear and Inhibit Simplified Schematic (Sheet 4)

LEGEND

⟨1⟩ EXPLANATION OF MATRIX:

A. COMPUTE COLUMN LISTS THE SIGNAL OUTPUT.

B. INPUTS REQUIRED ARE USED TO DEVELOP THE SIGNAL OUTPUT.

C. SIGNAL OUTPUT IS READ HORIZONTALLY. EACH HORIZONTAL LINE IS AN INDEPENDENT SIGNAL OUTPUT.

D. INTERPRET MATRIX TABLE AS SHOWN:

(1) ONE (1) INDICATES THIS INPUT AS NAMED MUST BE THERE TO GET THE OUTPUT.

(2) ZERO (0) INDICATES THIS INPUT AS NAMED MUST NOT BE THERE TO GET THE OUTPUT.

(3) DASH (-) INDICATES THE OUTPUT DOES NOT DEPEND ON THIS INPUT.

18AC-580-10-(20-5)B-GRID

Figure 1. Maintenance Code Clear and Inhibit Simplified Schematic (Sheet 5)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

OPERATION - MISSION DATA LOADER

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: F/A-18 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 AND F/A-18 AFC 225

This WP supersedes WP024 00, dated 1 October 2000.

Reference Material

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Record of Applicable Technical Directives

Type/ Number	Date	Title and ECP No.	Date Incorp.	Remarks
F/A-18 AFC 253	-	U.S. Naval Reserves A$^+$ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A$^+$ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

1. INTRODUCTION.

2. The Maintenance Status Display and Recording System (MSDRS) operations are:

a. power requirements

b. 100 kHz MSDRS mux bus

c. data acquisition

d. data processing

e. nose wheelwell digital display indicator (WP010 00)

f. Mission Data Loader (this WP)

g. Mission Data Loader built-in test (WP026 00)

3. MISSION DATA LOADER.

4. The Mission Data Loader (MDL) operations are:

a. power requirements

b. record data (pre-flight only)

c. programmable memory

d. mission initialization data

e. erase data (post flight or manually)

f. erase and hold data

g. power down

5. **POWER REQUIREMENTS.** See WP007 00. The left 28vdc bus supplies 28vdc to the MDL power supply. The MDL power supply produces the voltages required for MDL operation.

6. **PROGRAMMABLE MEMORY.** The MDL has the ability to store programs to be done without interfering with normal operation. If loaded, these programs:

a. may be located in any area of bulk memory

b. are specified to the MDL

c. must occupy less than 70 percent of bulk memory

7. **MISSION INITIALIZATION DATA.** See WP025 00. The MDL is capable of loading MC 1 with mission initialization user files. When the aircraft is powered-up or MC 1 fails to communicate on the avionic mux bus with the MDL for more than 1 second, MC 1 automatically loads user files from the MDL.

8. The Mission Data Loader Mission Initialization (MUMI) display, accessible from the SUPT menu, and, WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), the MUMI Weapons Initialization display, provide visual indications of mission initialization files loaded from the MDL. If the MDL directory indicates that no user files are present, the MDL ID label displays NO IDENT. When the MDL directory indicates a user file is present, MC 1 displays the file option at the applicable push-button. The option is boxed when the push-button is pressed and as the user file is being read by MC 1. If the read is successful, the user data file is loaded in the appropriate MC memory location and the option is unboxed. When a user file is present and two checksum errors have resulted from reading the file:

a. MDL label displays NO IDENT.

b. WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000) the applicable load error displays (HARM, RDR, TCN, WYPT, S/S, OCS, IFF, DL13, ALR-67, GPS ALM, GPS WYPT, CIT (after F/A-18 AFC 292), JSOW, JDAM, SLMR, FLRP and WIND).

c. MC 1 sends maintenance code 160 to the signal data converter for storage.

d. If weight-on-wheels, MC 1 sends MDL LOAD caution to DDI for display.

9. **ERASE DATA (CRYPTO SWITCH).** See WP025 00. Setting the intercommunication amplifier control CRYPTO switch to ZERO position sends an erase data discrete input ground to the MDL. The erase data input causes the MDL to erase all data stored between predetermined memory locations.

10. **ERASE AND HOLD DATA (MUMI DISPLAY).** See WP025 00. The Erase Controller (EC) function within MC 1 provides the capability to automatically and manually erase or inhibit erasing of classified data contained in the:

a. MDL

b. Stores Management Computer

c. MC 1

d. MC 2

11. When the EC determines classified mission initialization files have been read from the MDL, the EC classified data management system is activated. When activated and the aircraft is weight-on-wheels, MC 1:

a. Displays HOLD, ERASE, and MC SUSPEND options on the MUMI.

b. Displays CDATA advisory.

c. Sends applicable maintenance code to signal data converter for storage:

(1) C01 - MDL contains classified data.

(2) C02 - MC 1 contains classified data.

(3) C03 - MC 2 contains classified data.

(4) C04 - Stores Management Computer contains classified data.

(5) C05 - WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000); weapons contain classified data.

12. The MDL armament computer, MC 1 and MC 2 automatically erase when:

a. WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000), airspeed is less than 80 knots.

b. Left and right power lever angle is less than 29 degrees and transition to weight-on-wheels, or,

c. Pilot ejection.

13. Automatic erase can be inhibited by selecting the HOLD push-button option:

a. HOLD boxed with MU displayed prevents automatic erase of the MDL.

b. HOLD boxed with ALL displayed prevents automatic erase of all units (MDL, armament computer, MC 1 and MC 2).

14. The EC commands the MDL and armament computer to erase first. When they have erased, the EC commands the MC 1 and MC 2 to start erasing. The MC ERASE IN XX SEC countdown timer starts (60 seconds). During the countdown the MC SUSPEND push-button option cycles between boxed and unboxed. When the timer reaches zero, the decision to continue erasing the remainder of the MC 1 and MC 2 depends upon the MC SUSPEND push-button being deselected (not boxed). When deselected, the remaining erase of MC 1 and MC 2 is completed.

15. Manual erase is initiated by pressing the ERASE push-button on the MUMI display. When pressed, ERASE is boxed and erasing proceeds the same as automatic erase described in paragraph 12. When erasing is complete, the ERASE push-button will unbox.

16. While erase is in progress the erase statuses are displayed on the MUMI display:

a. ERASING - erasing of unit is in progress

b. COMPLETE - erasing of unit is complete

c. FAILED - unit failed to erase

17. When erase fails, MC 1:

a. Retains the MUMI ERASE and HOLD push-button options.

b. Sends the ERASE FAIL caution to the DDI for display.

18. When erasing is complete, MC 1:

a. Removes the ERASE, HOLD and MC SUSPEND push-button options from the MUMI display.

b. Removes the CDATA advisory from display.

c. Resets the applicable maintenance codes.

19. **POWER DOWN.** See WP006 00. The MDL enters a power down mode when the 28vdc input goes below a predetermined value. This allows the MDL to start and orderly shutdown sequence. When entering the power down mode the MDL sends mission data loader mux ready low to MC 1.

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - MISSION DATA LOADER MISSION INITIALIZATION

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: WITH DIGITAL DATA COMPUTER CONFIG/IDENT 15C AND UP (A1-F18AC-SCM-000) AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 AND F/A-18 AFC 225

Reference Material

None

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F/A-18 AFC 253	-	U.S. Naval Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

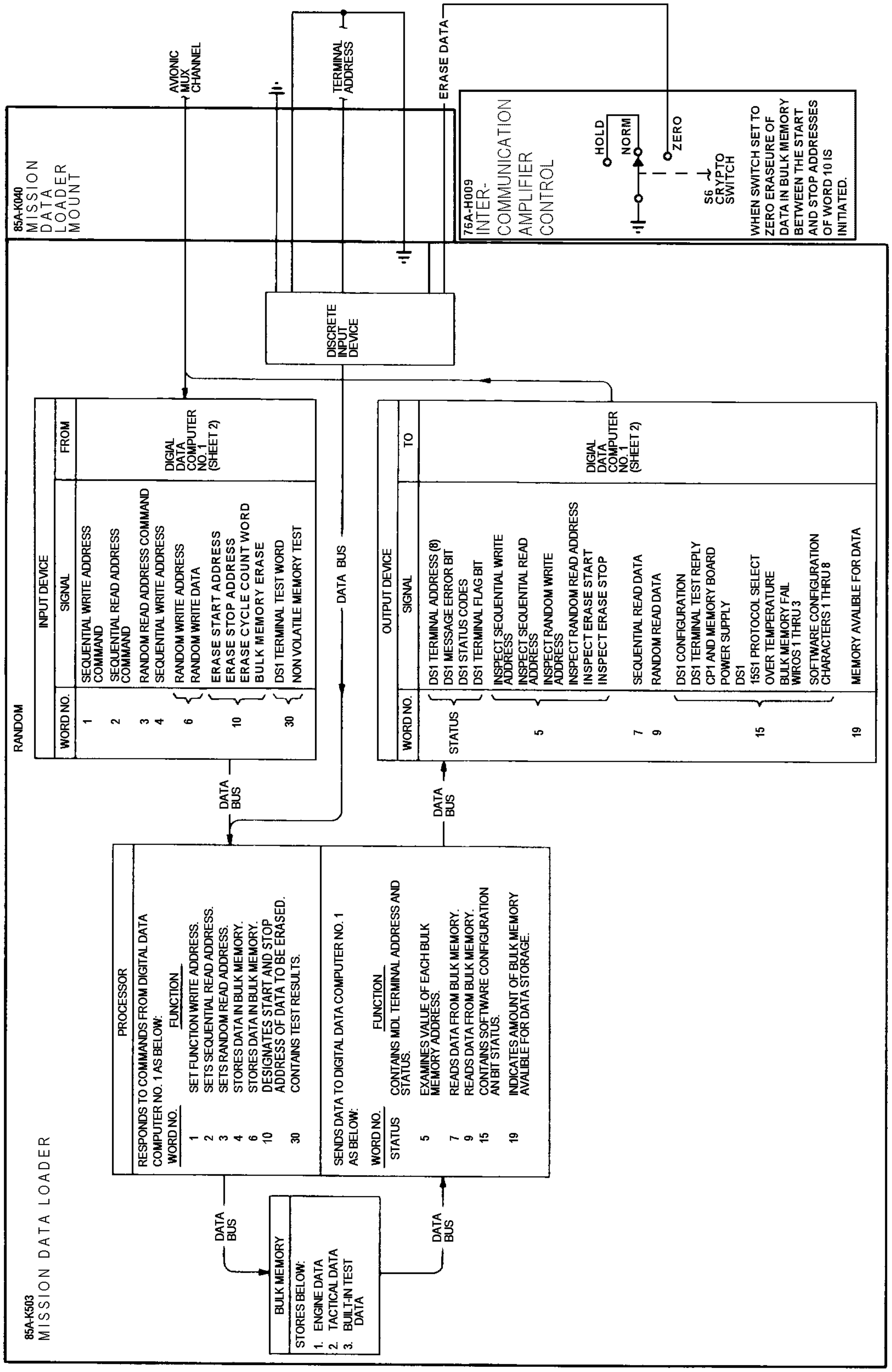
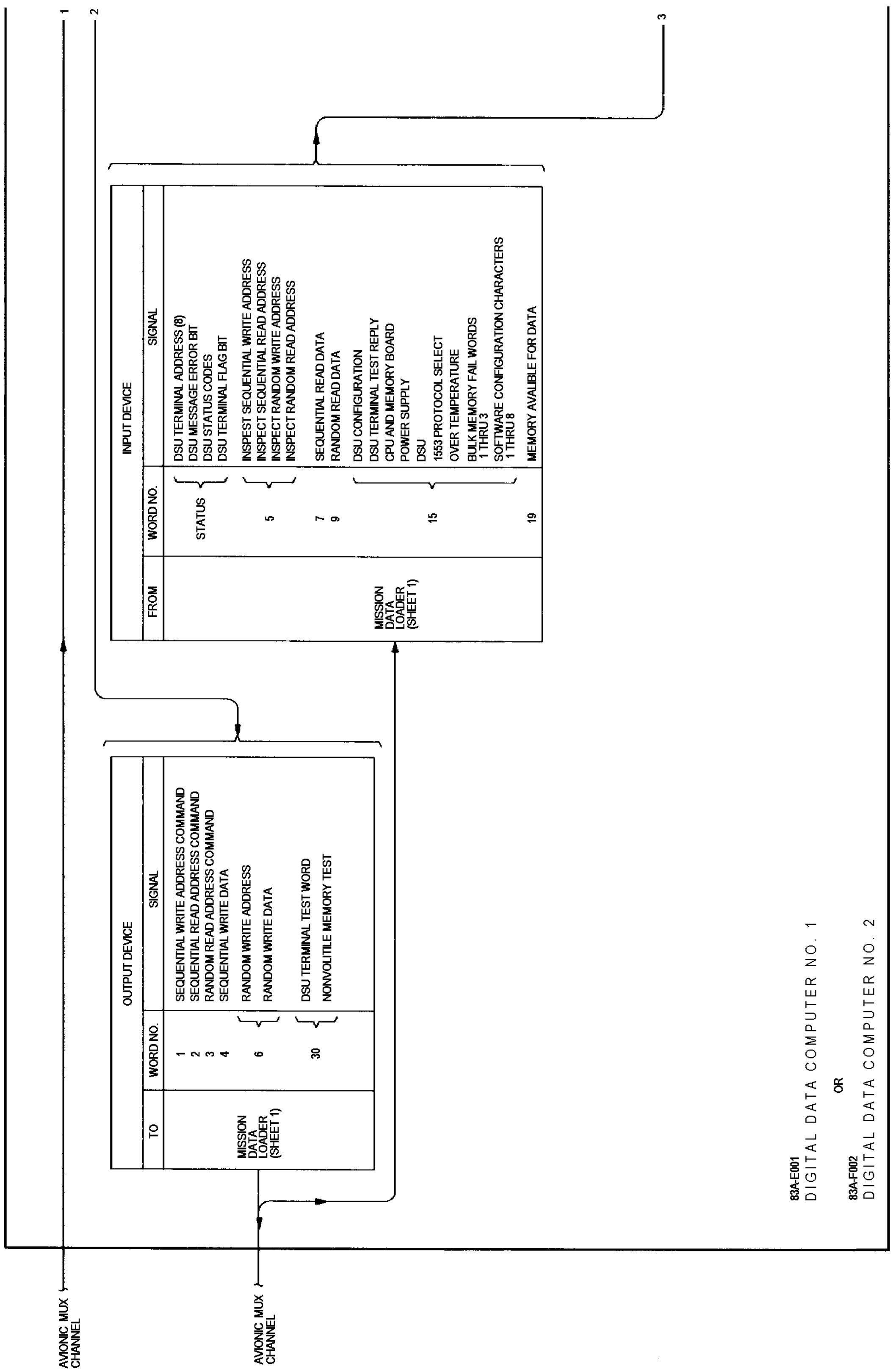


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 1)



02500102

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 2)

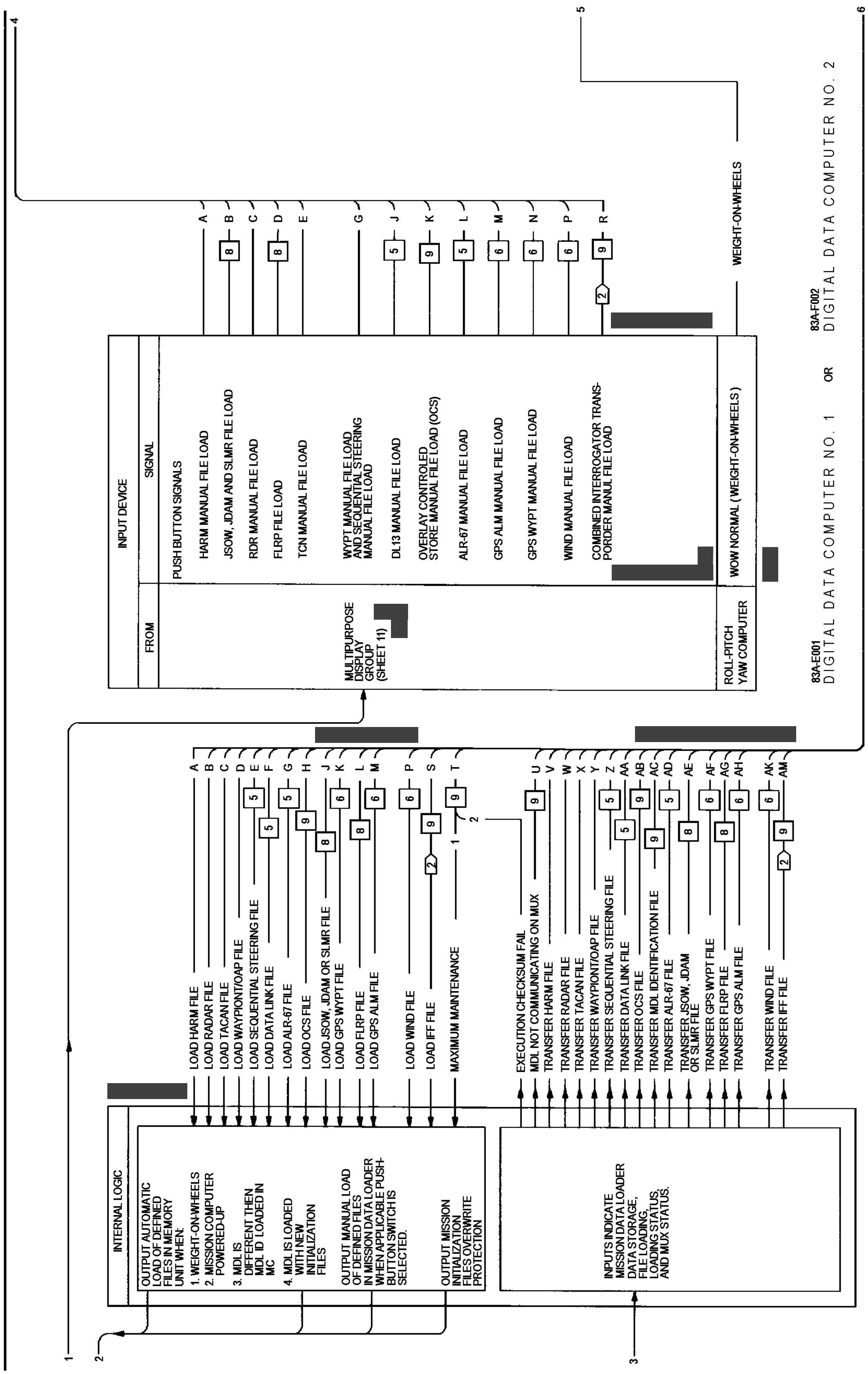
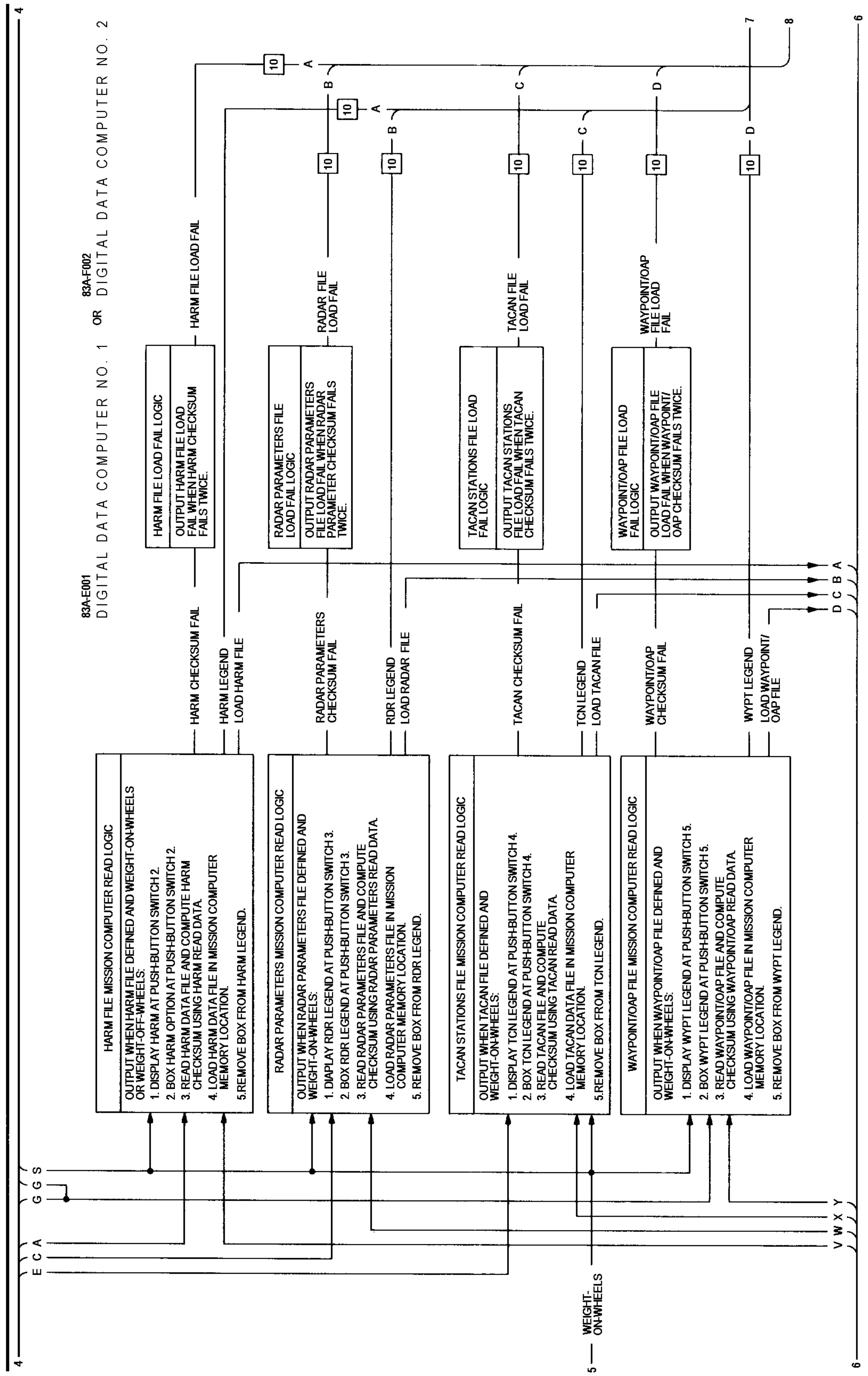
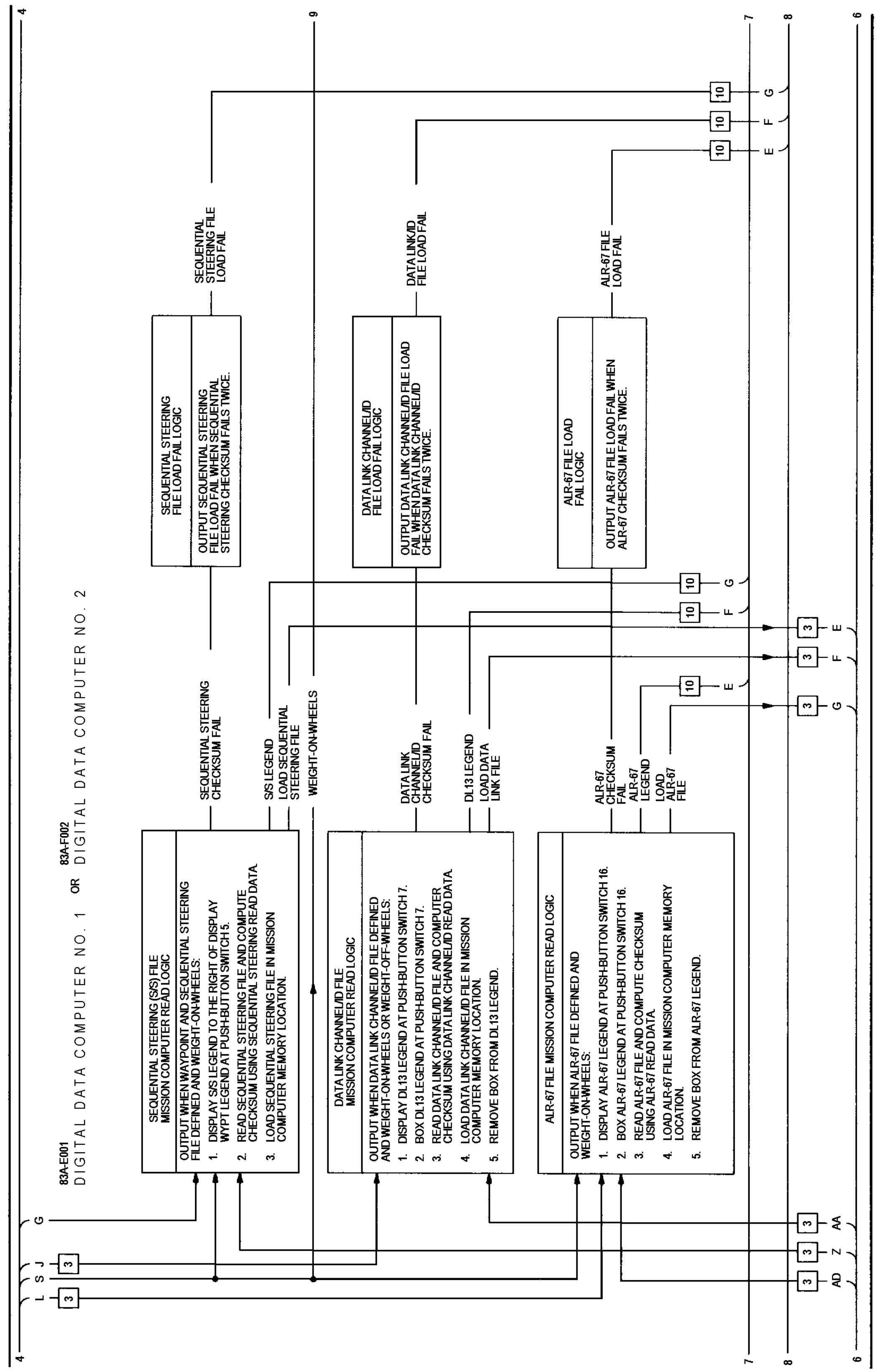


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 3)



02500104

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 4)



02500105

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 5)

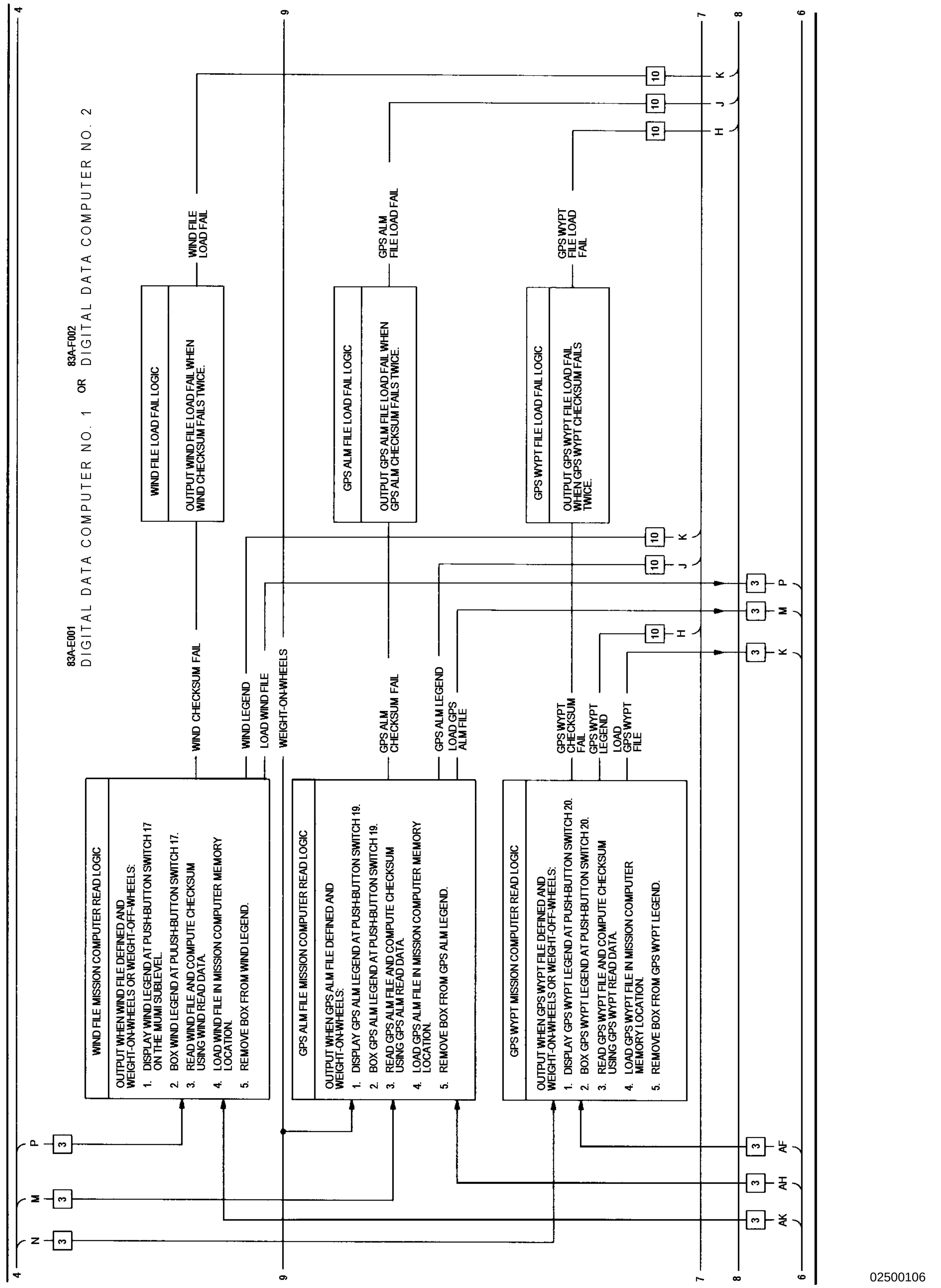
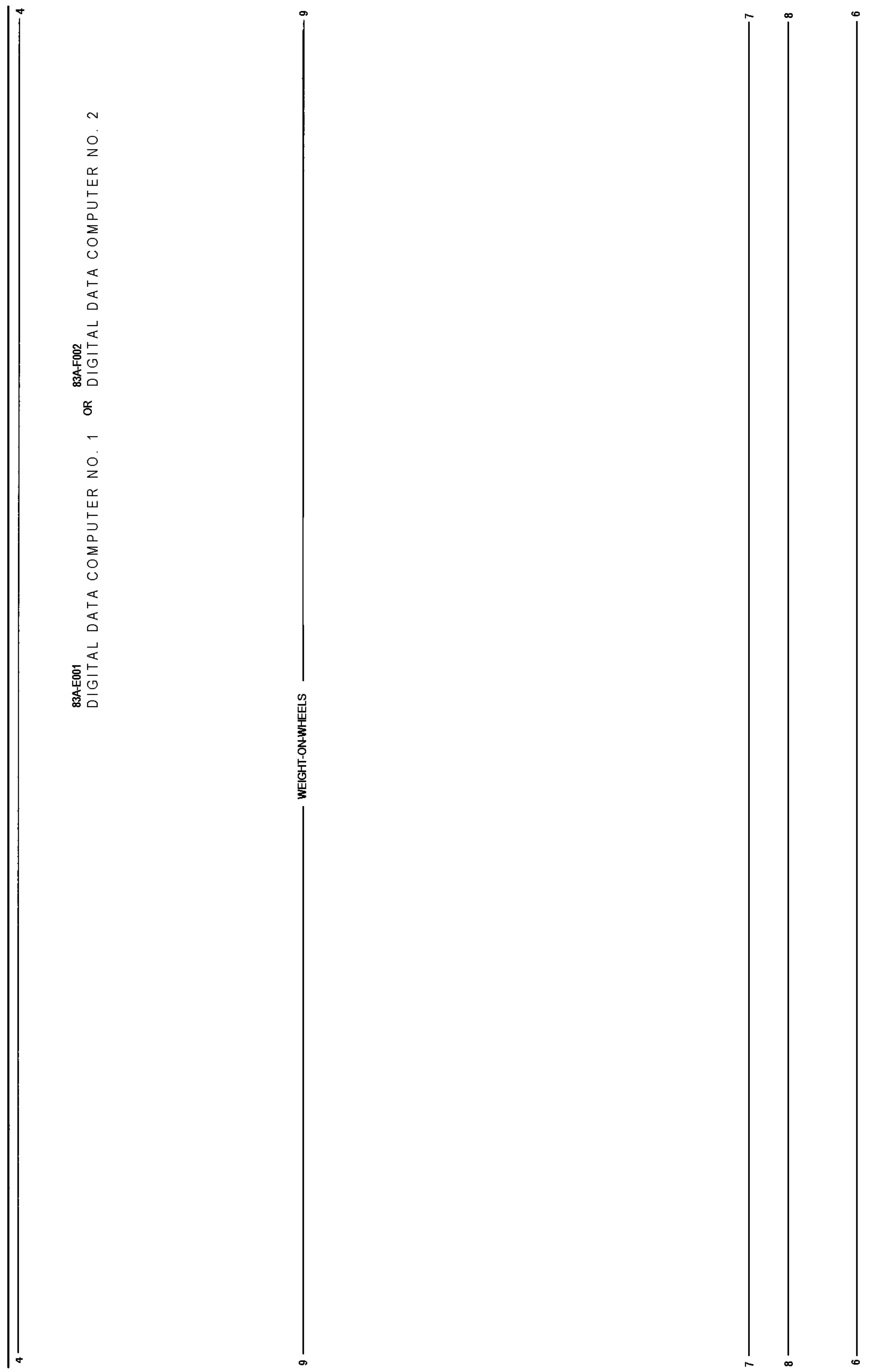
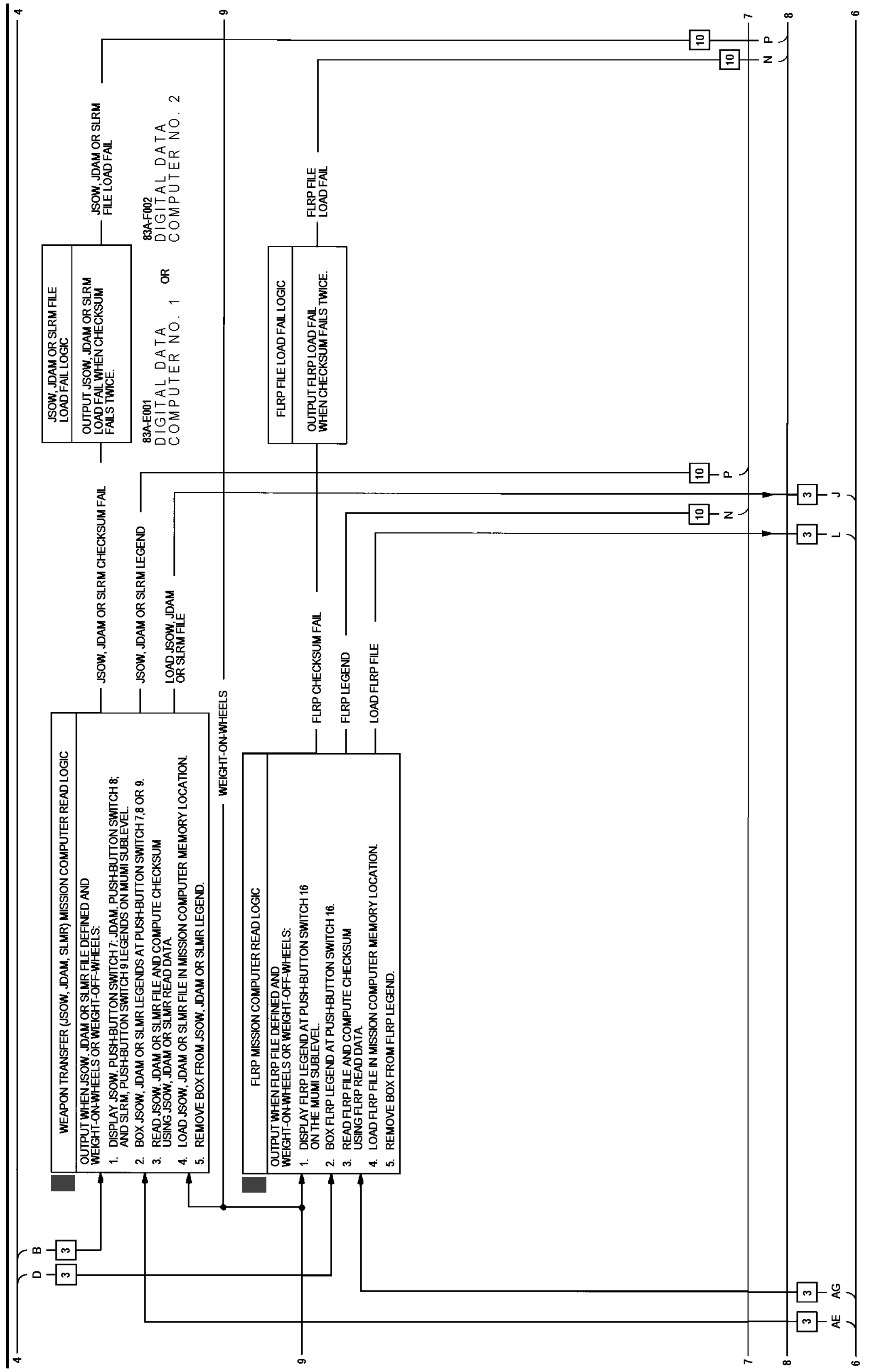


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 6)



02500107

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 7)



02500108

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 8)

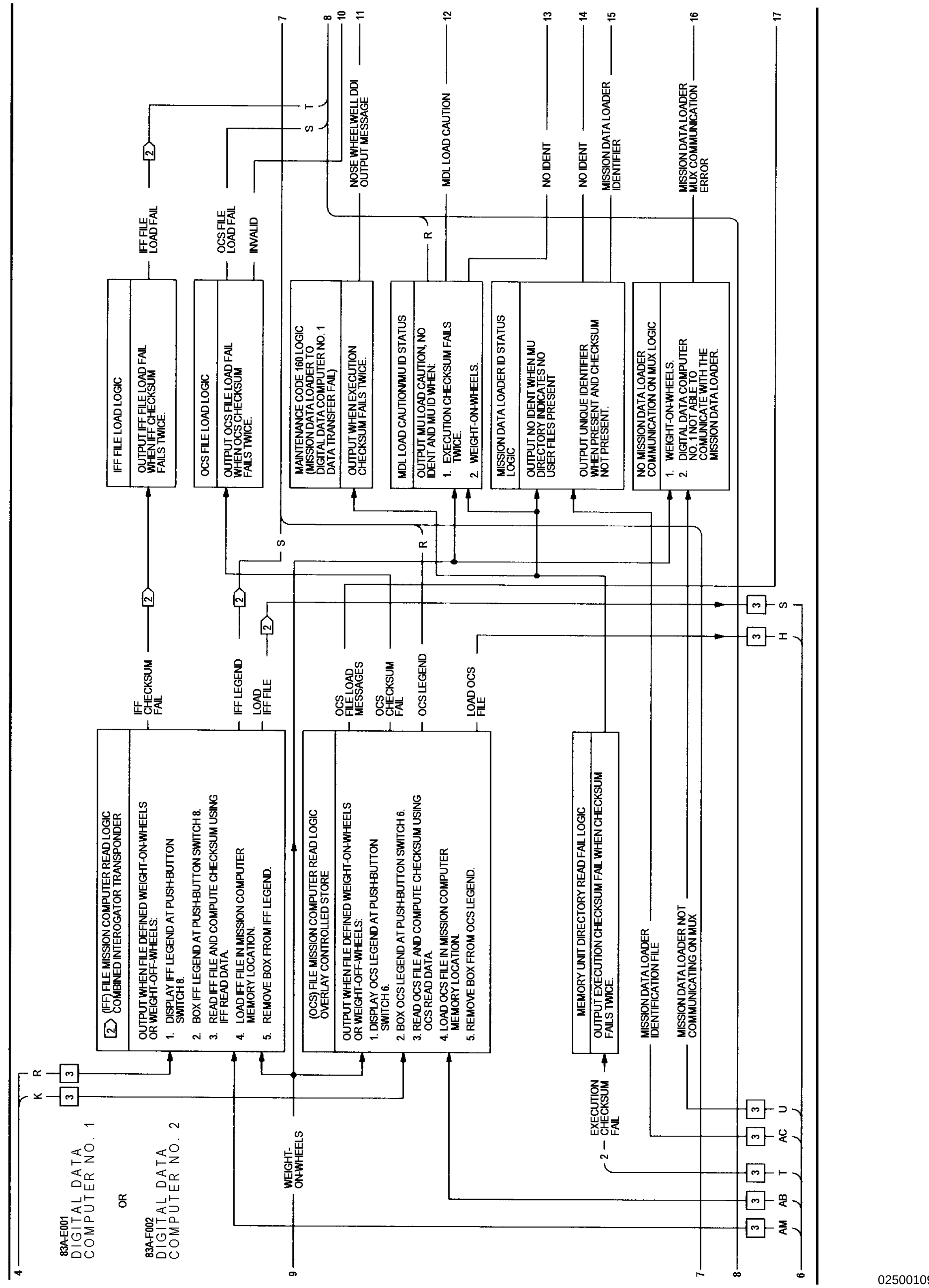


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 9)

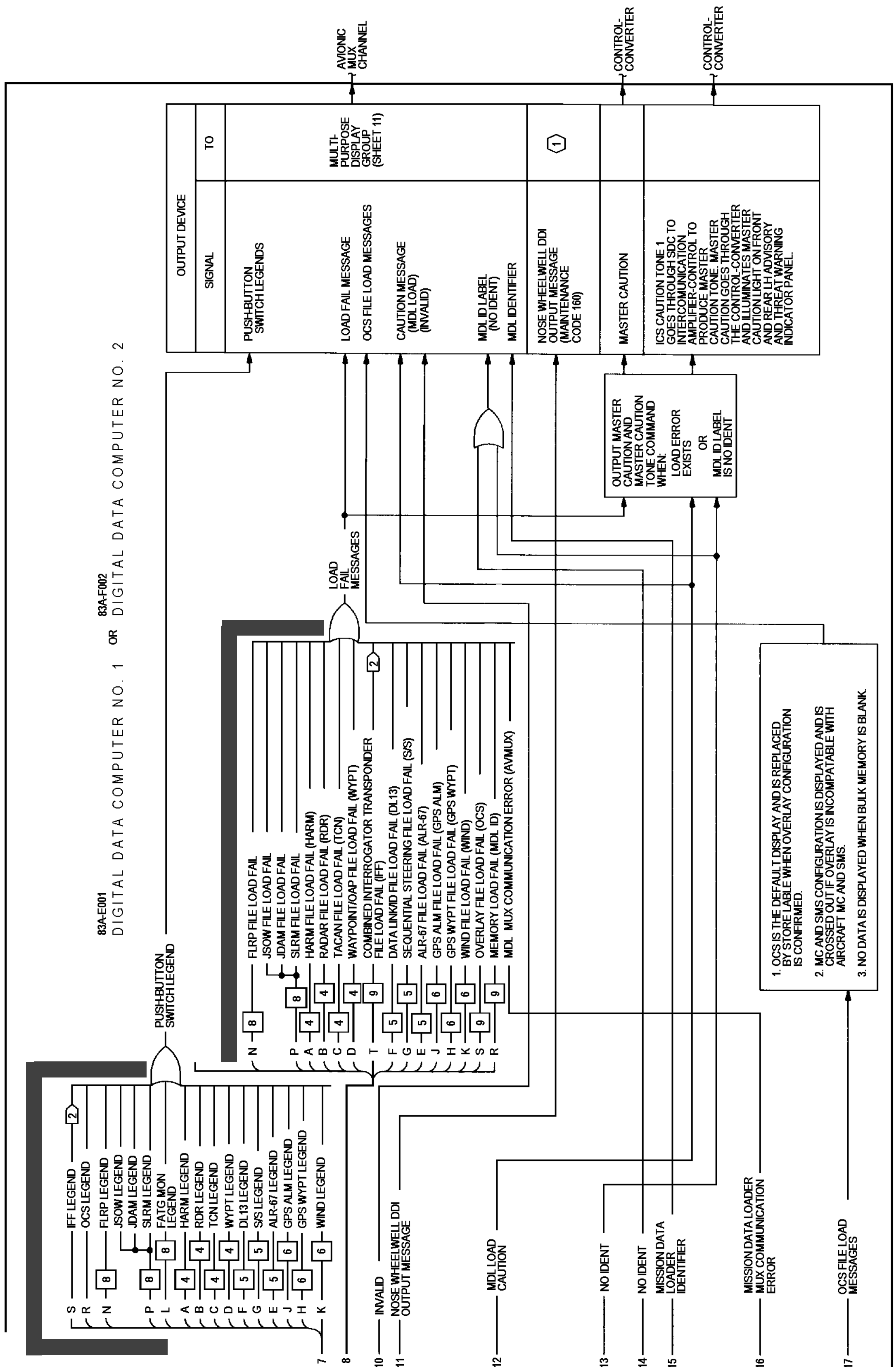


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 10)

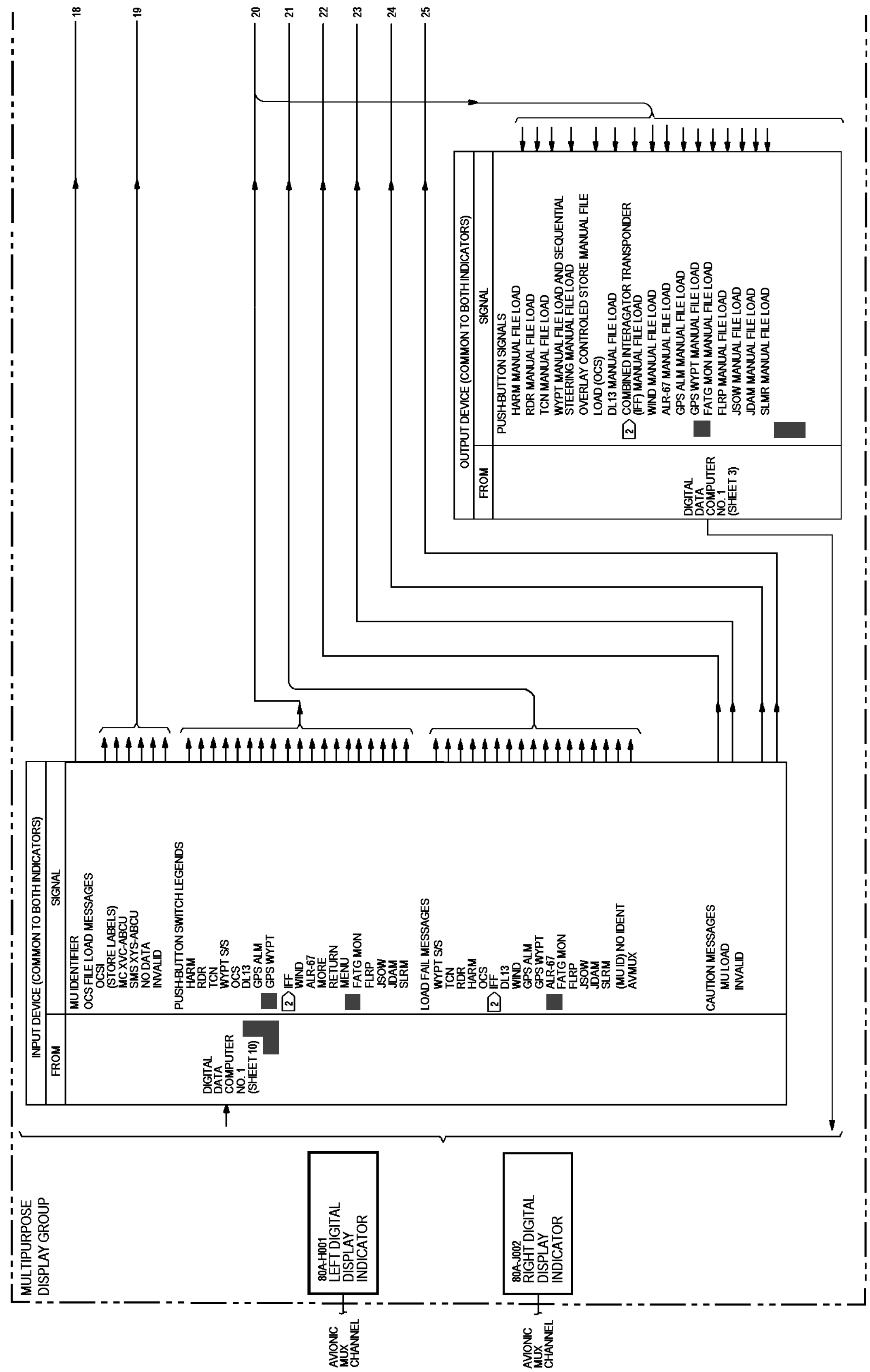
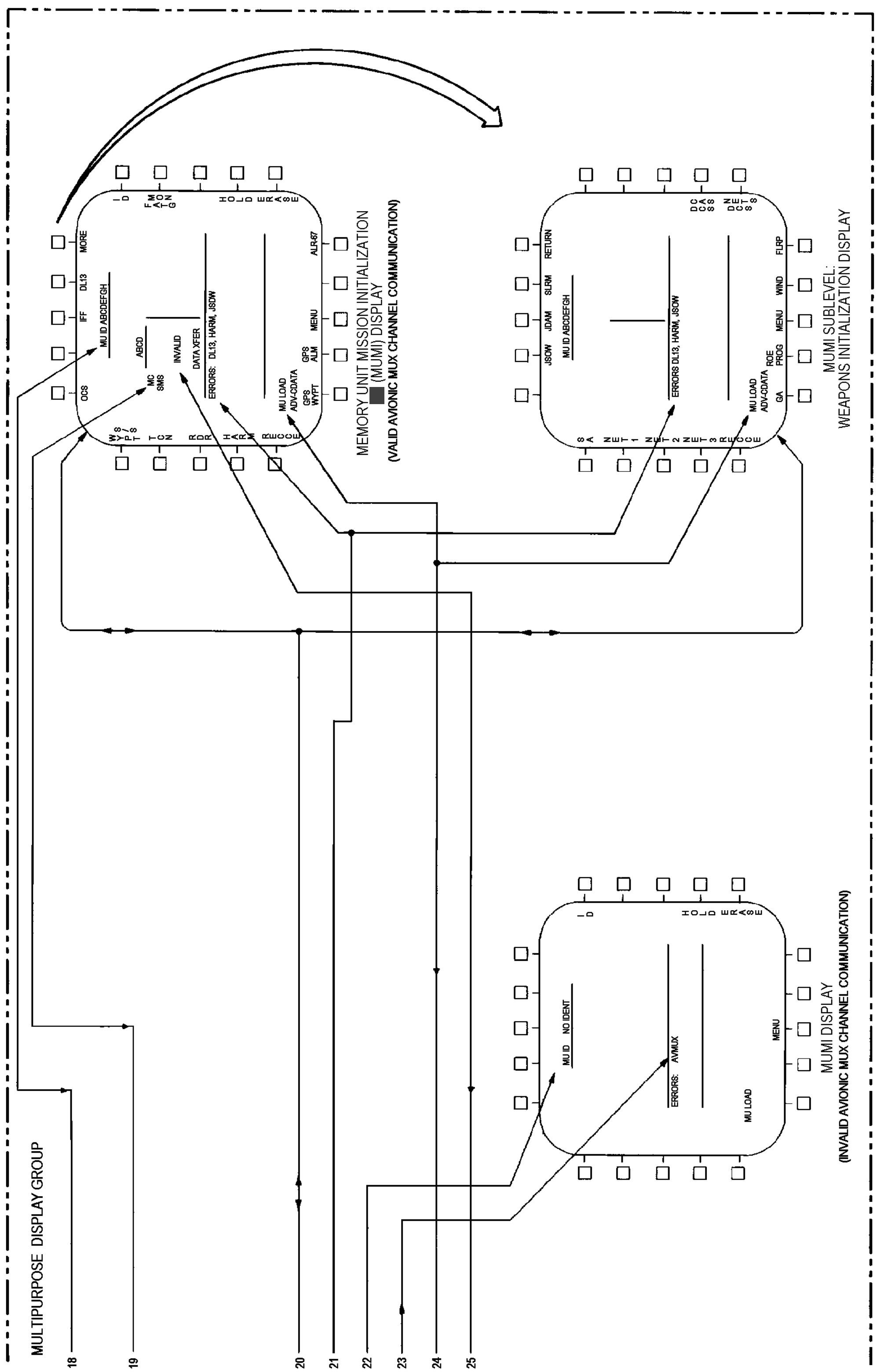


Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 11)



02500112

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 12)

LEGEND

2 F/A-18 162394 THRU 163175 AFTER F/A-18 AFC 292

1 REF CODES FOR SYSTEM BUILT-IN TEST INPUTS ARE SHOWN ON INDIVIDUAL SYSTEM SCHEMATICS WHEN DIGITAL DATA COMPUTER NO. 1 DETERMINES A MAINTENANCE CODE CONDITION EXISTS. PROCESSING IS THE SAME FOR ALL MAINTENANCE CODE.

Figure 1. Mission Data Loader Mission Initialization Simplified Schematic (Sheet 13)

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

OPERATION - MISSION DATA LOADER BUILT-IN TEST

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: F/A-18 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 AND F/A-18 AFC 225

This WP supersedes WP026 00, dated 1 October 2000.

Reference Material

None

Maintenance Status Display and Monitoring System A1-F18AC-580-100
Simplified Schematic - Mission Data Loader Built-In Test WP027 00

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F/A-18 AFC 253	-	U.S. Naval Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A^+ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

1. INTRODUCTION.

2. The Maintenance Status Display and Recording System (MSDRS) operation are:

a. power requirements (WP006 00)

b. 100 kHz MSDRS mux bus

c. data acquisition

d. data processing

e. nose wheelwell digital display indicator (WP013 00)

f. Mission Data Loader (WP024 00)

g. Mission Data Loader Built-In test (this WP)

3. MISSION DATA LOADER BUILT-IN TEST.

4. See WP027 00. The Mission Data Loader (MDL) Built-In Test (BIT) operation are:

a. Power-On BIT

b. Periodic BIT (PBIT)

c. Initiated BIT (IBIT)

d. BIT Failure Indications

5. **POWER-ON BIT.** For MDL functions tested during power-on BIT, see table 1. Power-on BIT:

a. is software controlled.

b. starts on electrical power application.

c. results in sending MDL mux ready discrete to digital data computer no. 1 (MC 1) to indicate MDL is operational and ready for communication.

6. **PERIODIC BIT.** For MDL functions tested during periodic BIT, see table 1. Periodic BIT:

a. is software controlled.

b. is done once per second.

c. tests MDL functions that can be tested without interfering with normal operation.

7. **INITIATED BIT.** For MDL functions tested during initiated BIT, see table 1. Initiated BIT:

a. is manually controlled by pressing MU pushbutton switch on the cockpit digital display indicator (DDI) BIT control display.

b. is the most extensive MDL built-in test.

c. requires approximately 10 seconds for completion.

8. The MDL sends initiated BIT results by way of avionic mux channel 4 to MC 1. MC 1 monitors BIT results and sends applicable MDL BIT status message by way of avionic mux channel to cockpit DDI for display as below:

a. NOT RDY - displayed if MDL is not installed, power not applied, or has a catastrophic failure.

b. MUX FAIL - displayed if MDL is in normal mode but MC 1 fails to establish communication with MDL by way of avionic mux channel 4.

c. IN TEST - displayed if MDL is in normal mode, MC 1 to MDL communication is good and MDL is in test.

d. RESTRT - displayed if MDL is in normal mode, MC 1 to MDL communication is good and MDL BIT timer times out before MDL initiated BIT is completed.

e. DEGD - displayed if MDL is in normal mode, MC 1 to MDL communication is good and any MDL function fails.

f. GO - displayed if MDL is in normal mode, MC 1 to MDL communication is good and MDL completes initiated BIT with no MDL failures reported

g. OP GO - displayed if MDL is in normal mode, MC 1 to MDL communication is good and any non-critical MDL function fails.

h. PBIT GO - displayed if MDL initiated BIT was not selected since power-up, and periodic BIT does not report any errors.

9. **BIT FAILURE INDICATIONS.** The MDL sends all BIT results by way of avionic mux channel 4 to MC 1. MC 1 monitors the BIT results to determine MDL failure indications below:

a. maintenance code 008 - MDL terminal fail

b. maintenance code 159 - MDL fail

c. maintenance code 160 - MDL to MC 1 data transfer fail

10. **Maintenance Code 008.** When power is applied to the MDL, the MDL sends an MDL mux ready high to MC 1. MC 1 tries to establish communication with the MDL as below:

a. sends MDL terminal test word by way of avionic mux bus 4X and 4Y.

b. commands MDL to send terminal test reply to MC 1.

c. compares MDL terminal test reply to terminal test word sent.

11. If MC 1 fails to establish communication or looses communication with the MDL, the below occurs:

a. If communication fails on avionic mux bus 4X and 4Y, MC 1 sends maintenance code 008 to SDC for storage.

b. If communication fails on avionic mux bus 4X and 4Y, MC 1:

(1) sends maintenance code 008 to SDC for storage.

(2) sends MU BIT status message MUX FAIL to cockpit DDI for display during initiated BIT.

12. **Maintenance Code 159.** MC 1 sets MDL fail maintenance code 159 if any mission data loader function fails.

13. **Maintenance Code 160.** MC 1 sets MDL to MC 1 data transfer fail maintenance code 160 if MDL directory checksum fails.

Table 1. Mission Data Loader Functions Tested

MDL Function	Power-on BIT	Periodic BIT	Initiated BIT
Processor	X	X	X
Random Access Memory	X	X	X
Program Memory			X
Bulk Memory			X
Avionic Mux Interface	X		X
Power Supply	X	X	X

ORGANIZATIONAL MAINTENANCE

PRINCIPLES OF OPERATION

SIMPLIFIED SCHEMATIC - MISSION DATA LOADER BUILT-IN TEST

MAINTENANCE STATUS DISPLAY AND RECORDING SYSTEM

EFFECTIVITY: F/A-18 AFTER F/A-18 AFC 253 OR F/A-18 AFC 292 AND F/A-18 AFC 225

Reference Material

None

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Record of Applicable Technical Directives

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F/A-18 AFC 253	-	U.S. Naval Reserves A$^+$ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0560R1)	1 Oct 00	-
F/A-18 AFC 292	-	U.S. Marine Corps Reserves A$^+$ Avionics Upgrade; Incorporation of (ECP MDA-F/A-18-0583)	1 Oct 00	-
F/A-18 AFC 225	-	Avionics Multiplex Bus Upgrade; Modification of (ECP MDA-F/A-18-0529)	1 Jun 02	-

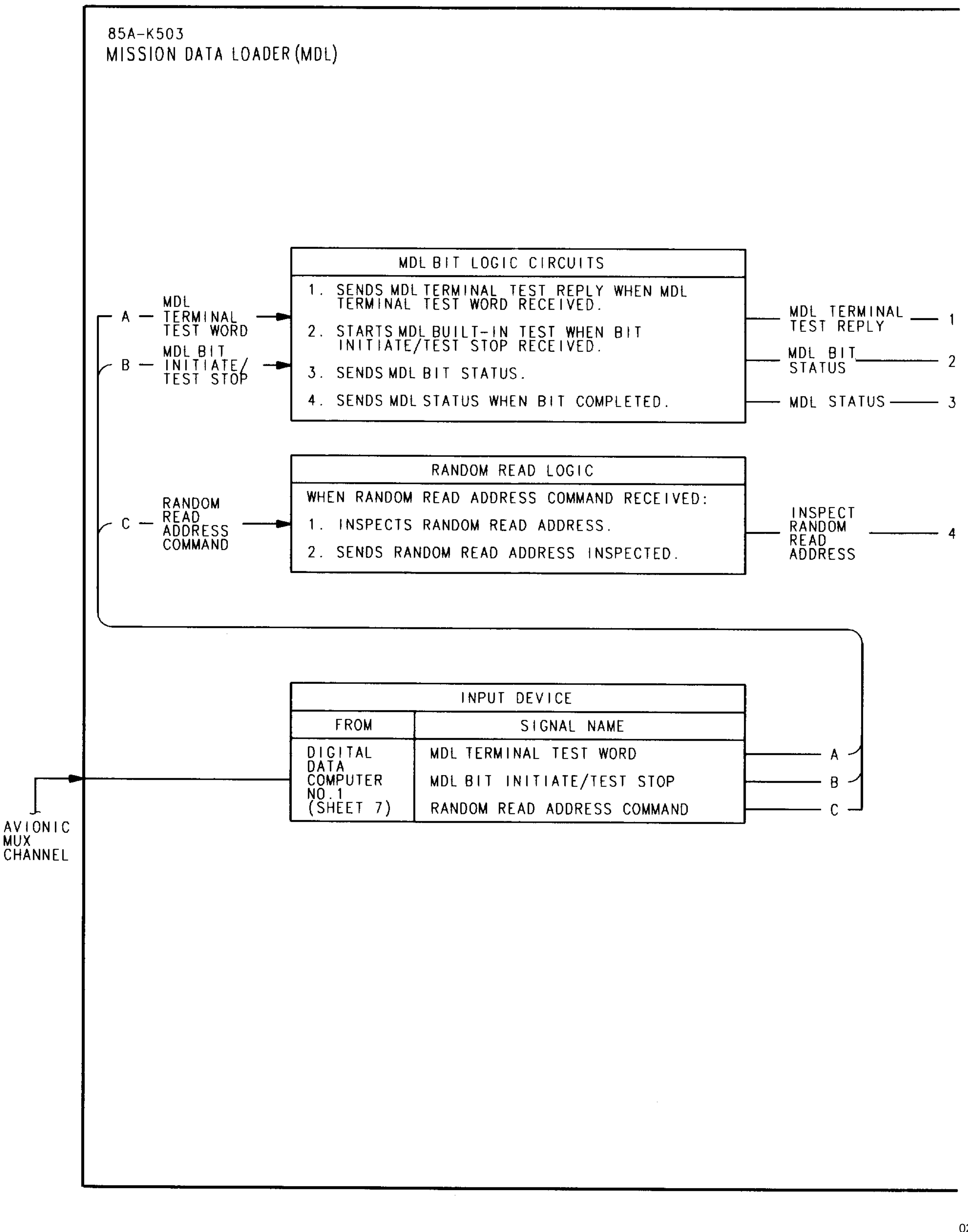
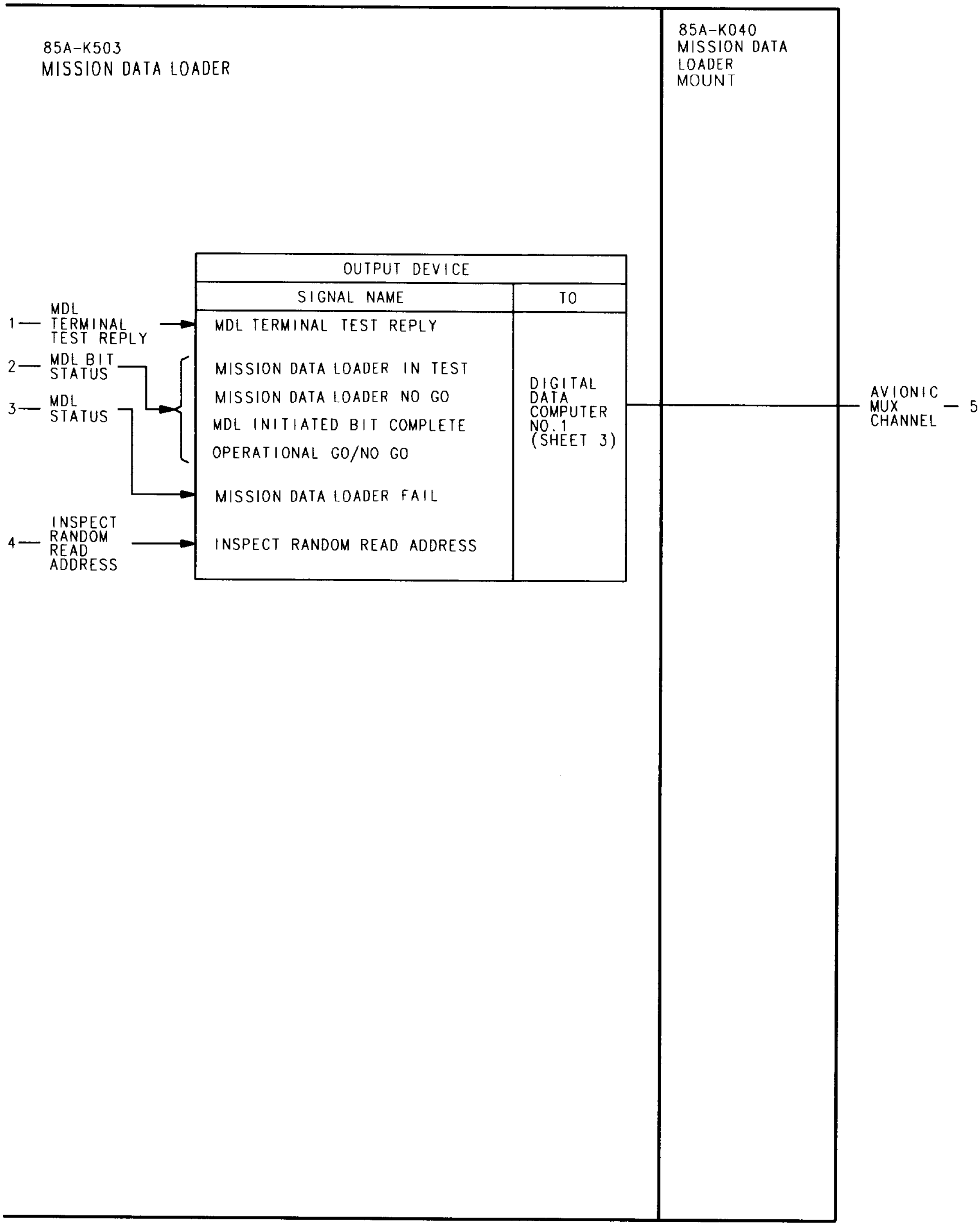


Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 1)



02700102

Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 2)

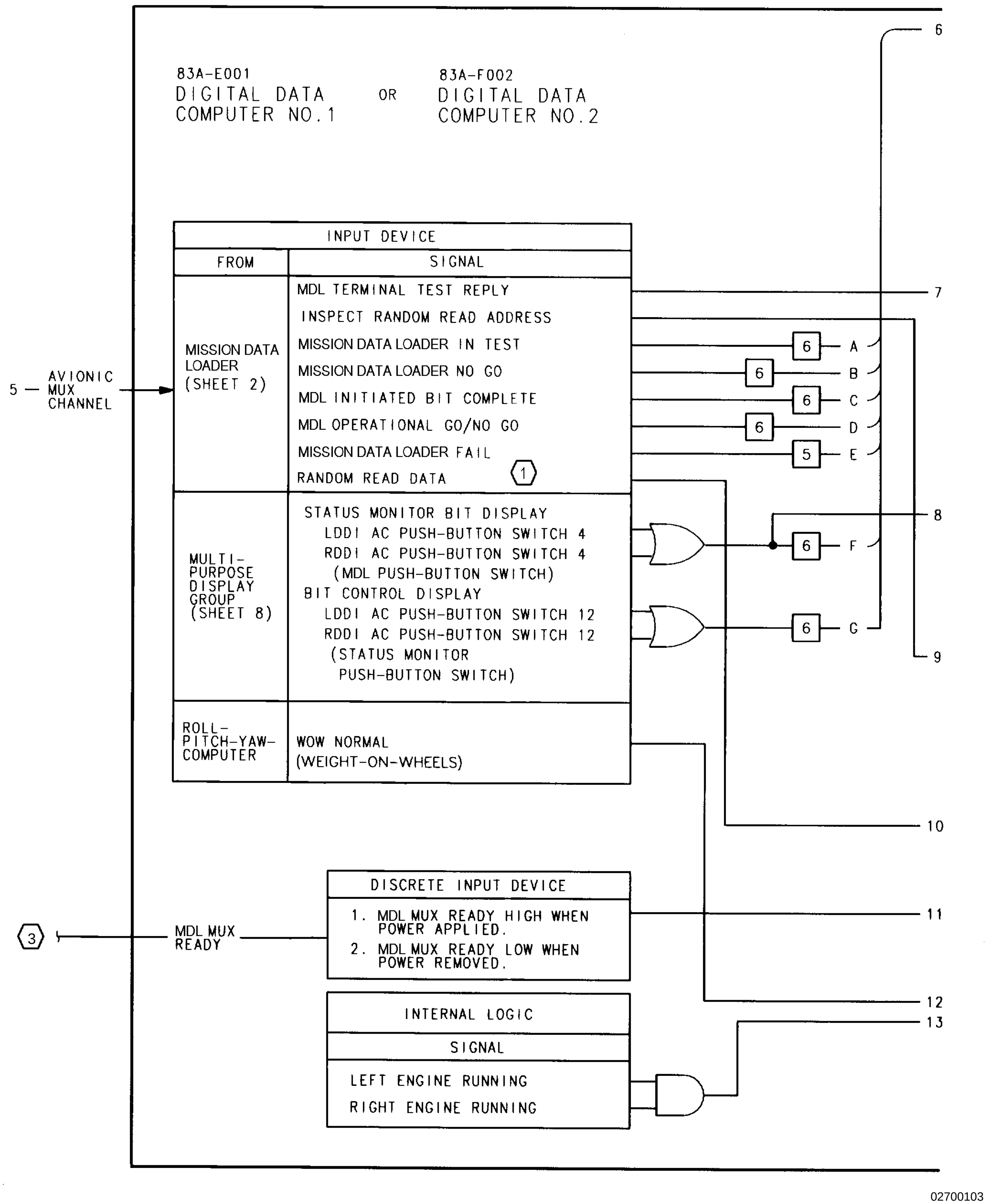


Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 3)

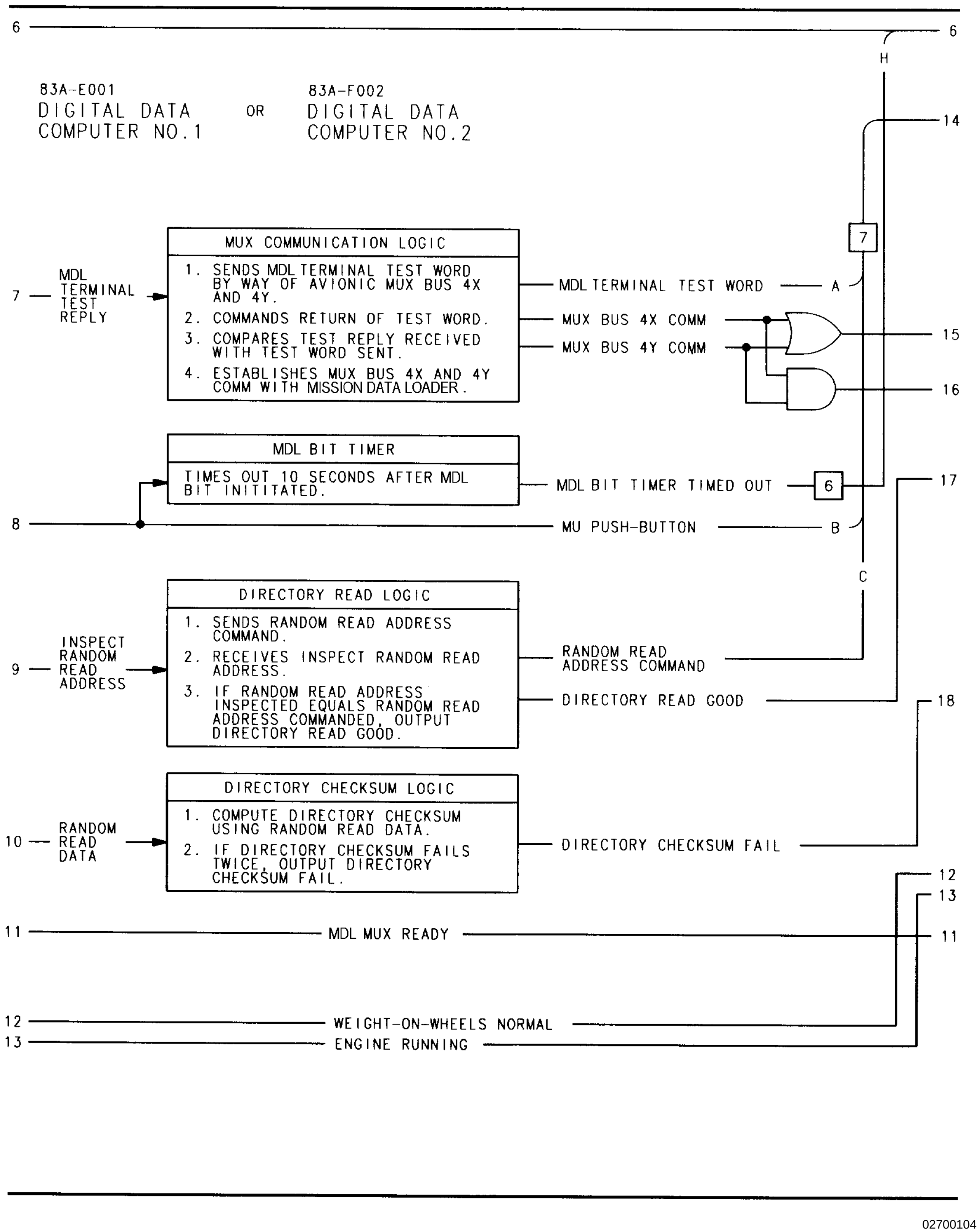
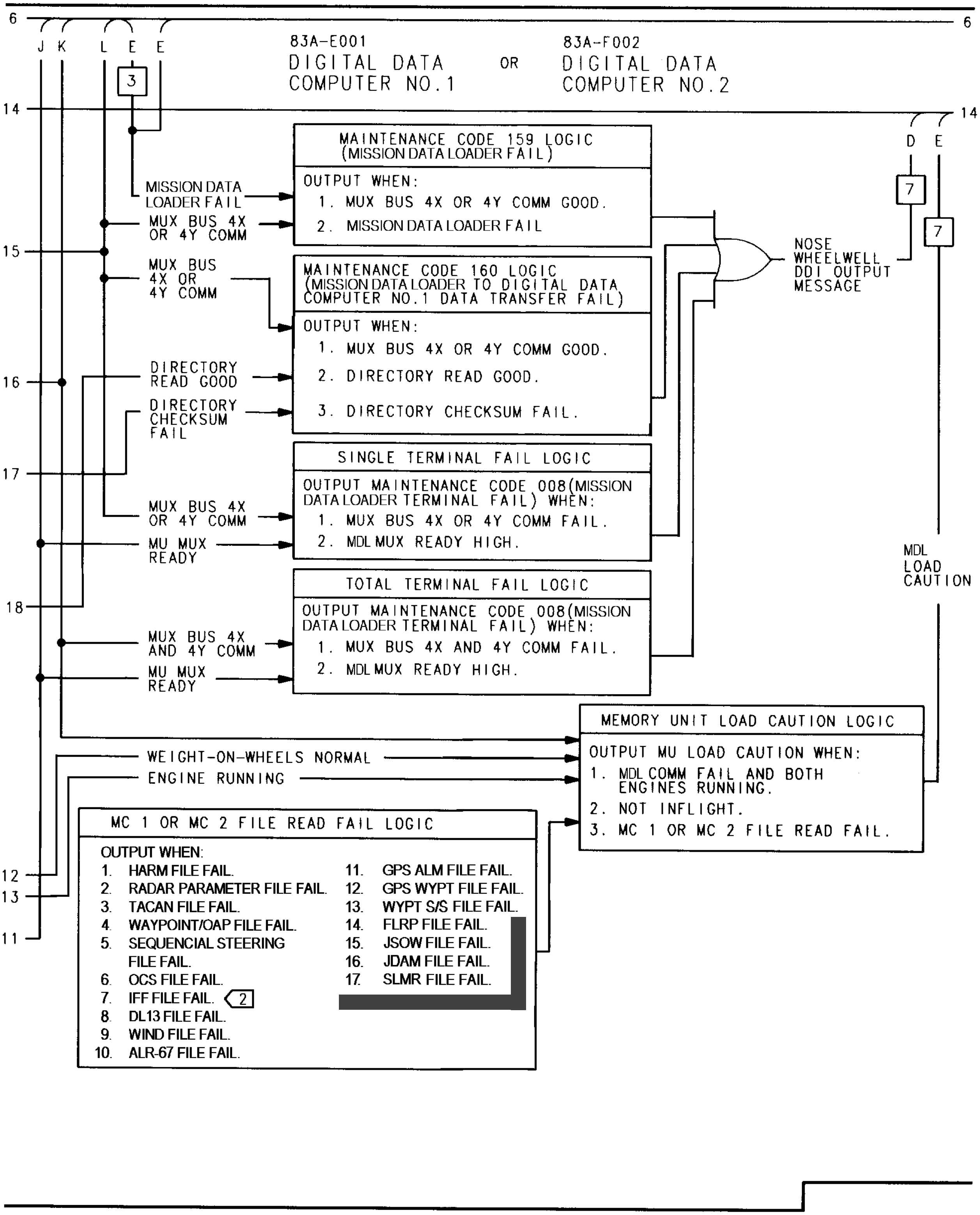
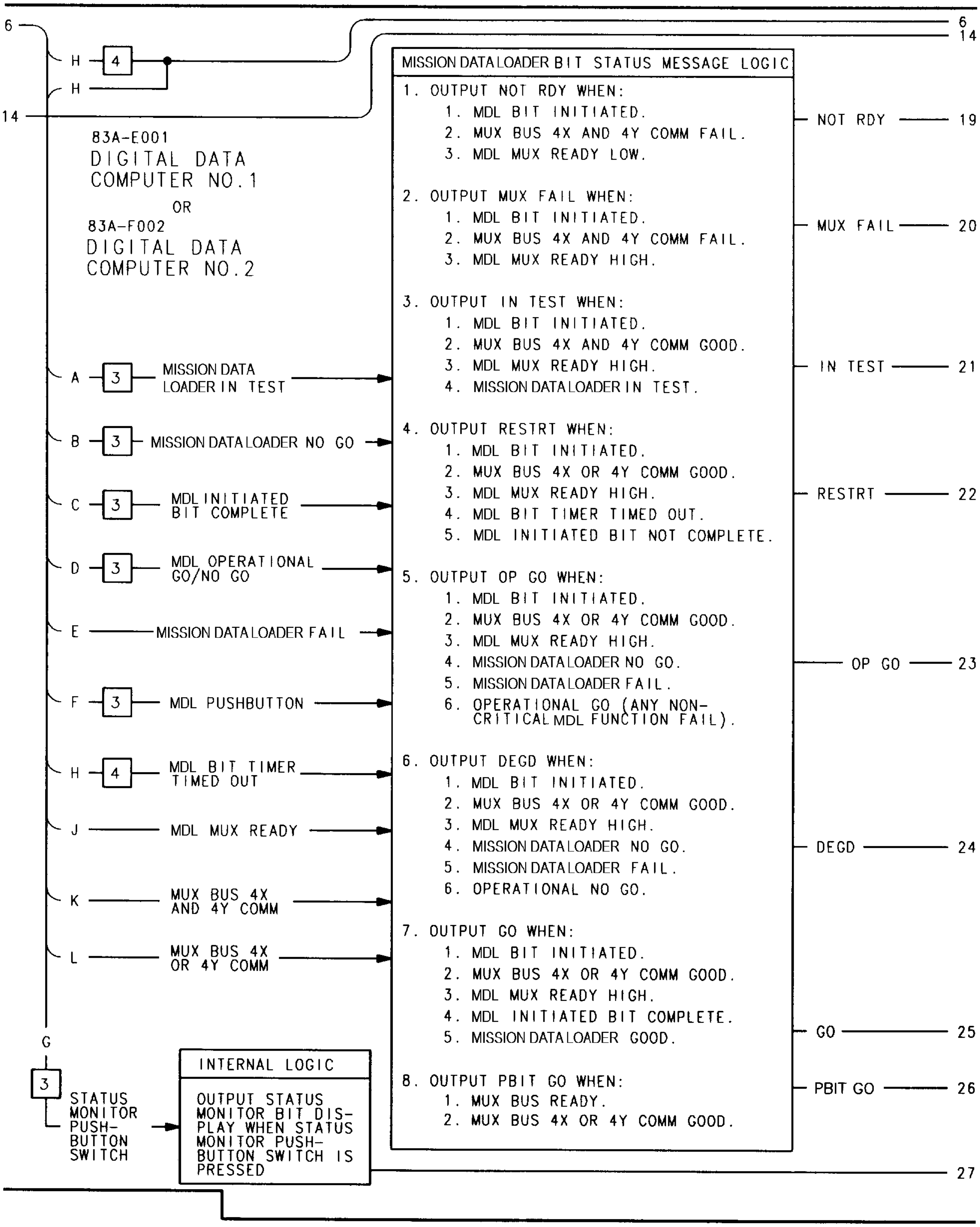


Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 4)



02700105

Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 5)



02700106

Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 6)

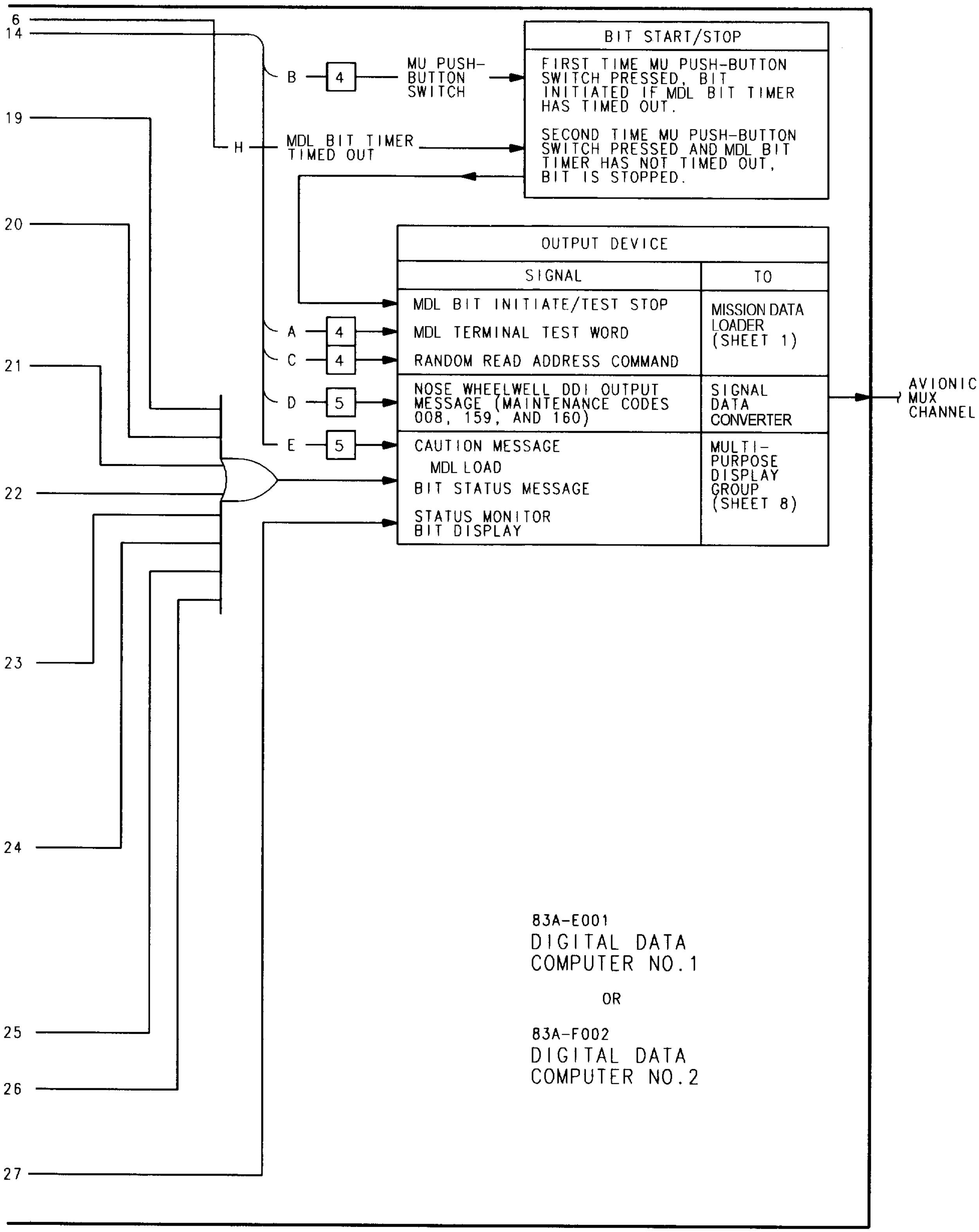


Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 7)

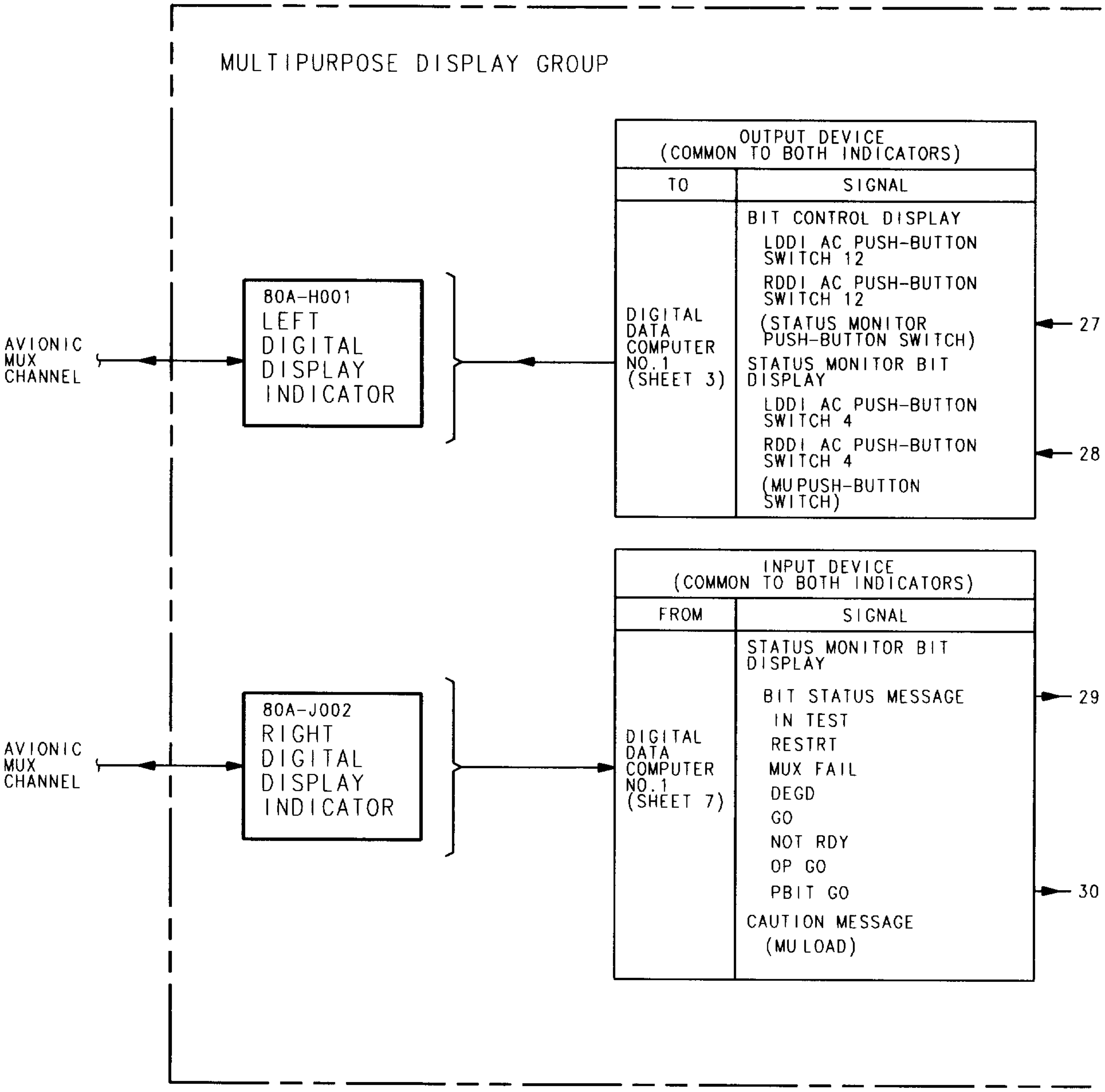
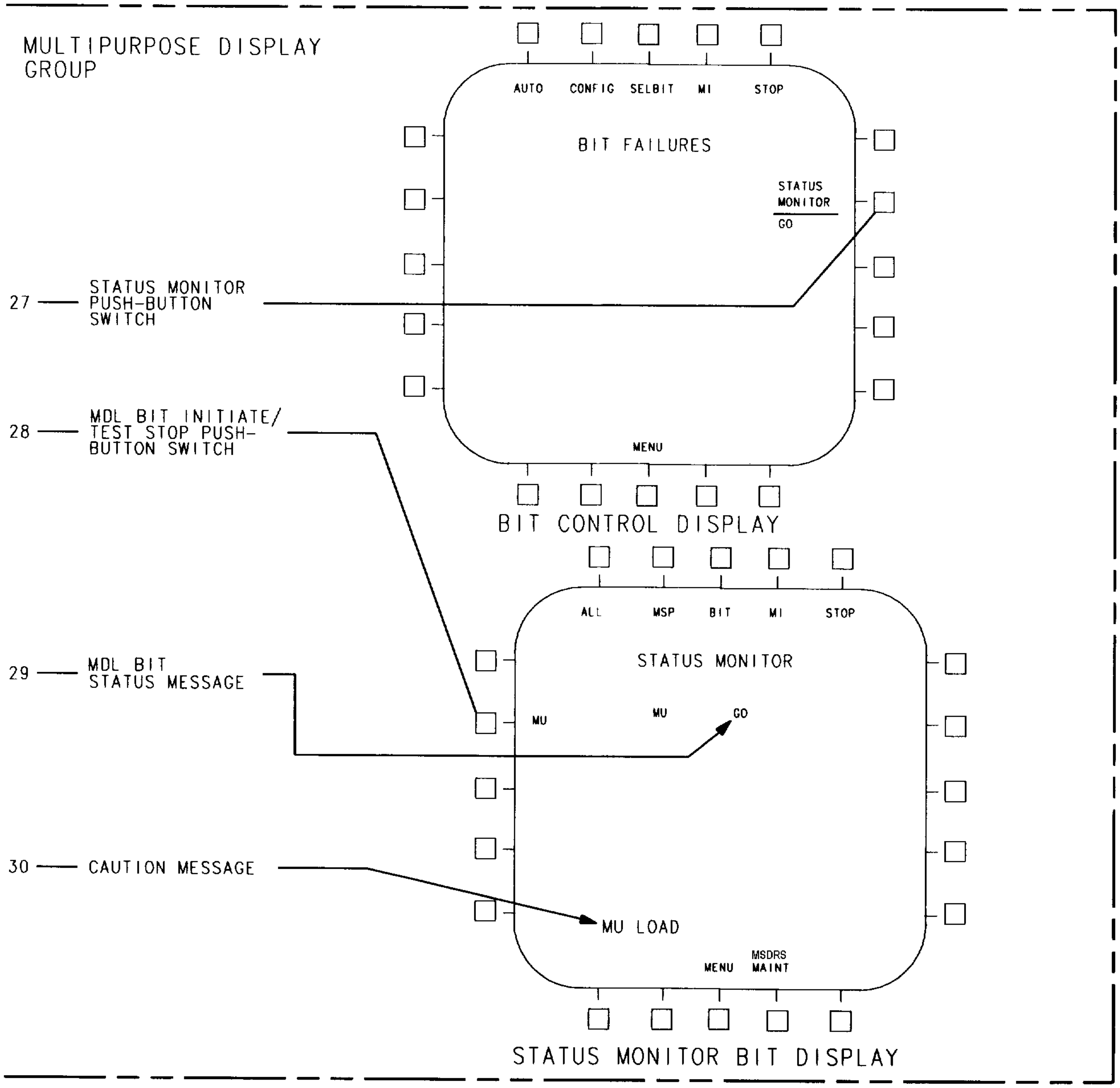


Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 8)



02700109

Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 9)

LEGEND

1	MISSION DATA LOADER SIMPLIFIED SCHEMATIC, WP025 00.
2	F/A-18 162394 THRU 163175 AFTER F/A-18 AFC 292.
3	POWER CONTROL SCHEMATIC WP 006 00.

Figure 1. Mission Data Loader Built-In Test Simplified Schematic (Sheet 10)